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THE Treasury Department has discovered, as the ENGINEERING AND MINING JOURNAL said it would, that its ruling on the rating of the value of lead in imported silver ores is too high when counted at one cent below the price of refined lead in New York, and it modifies this ruling to a value of 1¼ cents below the New York price. This is more nearly just, though still very high. The great evil is the imposition of the outrageous McKinley tariff on the entry of ores, which has effectually built up a rival smelting industry in Mexico, largely with American capital, and has driven a large and profitable business away from this country, and has imposed a heavy additional charge on the dry-ore miners.

This mischief cannot be remedied, for Mexico has now the industry that we should have had. Our smelters can only treat "in bond," exporting the lead they bring in in the form of bullion from Mexico. There never were greater exhibitions of stupid shortsightedness, and of the sacrifice of the interests of the many to promote those of a few rich men, than have been shown in our tariff on silver-lead ores, and the treasury rulings under which it has been administered.

THE resumption of work in the copper smelting department of the Pueblo Smelting and Refining Company, at Pueblo, Colo., which is to be put in operation upon the first of next month, after a long period of idleness, is further evidence of the growing importance of the output of copper ore in Colorado, to which we called attention in our issue of May 2nd. The amount of copper ore which is being opened in the mines of the San Juan district is steadily increasing, and a very large output could undoubtedly be made by them immediately if it were so desired. The Guston, Yankee Girl group, Hudson, National Belle, and other mines all have large quantities of silver-copper ore in sight, much of it carrying a high percentage of the latter metal. The owners of these mines are waiting, however, for a market close at hand, stoping none of this ore in the meanwhile.

The American Belle Mines, Limited, is already making preparations for the erection of copper smelting works of 300 tons per day capacity, at Durango, Colo., and it is expected that these will be completed early in 1892. The Rio Grande Southern railway, which is now being built, will furnish direct communication between the Red Mountain mines and Durango, which point seems to be admirably located for works of this kind.

The new Sedalia copper furnace at Sedalia has been blown in during the past two or three months, and is now, we believe, running regularly. With the Pueblo works in operation and the completion of those at Durango, a great increase in the copper production of Colorado may be expected in 1892, and it would not be surprising if within a few years it should equal the output of Arizona.

RAPID TRANSIT IN NEW YORK.

The Board of Rapid Transit Commissioners for the city of New York announced the route selected for the central portion of the city on the 23d inst. According to the resolutions adopted, this line is to consist of an underground four-track railway, diverging from the proposed Broadway line, at or near Fourteenth street, and running thence under Union Square and Fourth and Park avenues to near and south of Forty-second street; thence, curving to the westward, under such private property and streets as shall be found necessary, to Madison avenue, at or near Forty-fourth street. It is to run under Madison avenue to a point at or near Ninety-sixth street; thence, curving to the eastward, to a point not less than 100 feet from Madison avenue, whence it runs by a viaduct over private property to a point near One Hundred and Thirty-fourth street; thence by a curve to the eastward and by a bridge over the Harlem River. The specifications concerning the construction of this line are the same as those of the west side line, embodied in the resolutions of the Board, May 27.

The new route will furnish the needed rapid-transit facilities for the important and thickly settled part of the city immediately east of Central Park. It does not give communication along the extreme eastern portion of the island, for which a third line is contemplated. It is improbable, however, that this last will be considered for the present. The Second Avenue line of the elevated-railway system is not yet crowded to its full capacity, and with the relief that will be given that and the Third Avenue road by the proposed central tunnel, transportation facilities for the eastern division of the city should be adequate for the present.

No definite decision concerning the construction of the proposed tunnels has yet been reached by the Board. Its engineers are busily engaged upon the matter, but the task is one of magnitude, and the recommendations to the Board of Aldermen are necessarily to be made in detail. It is practically decided, however, that the tunnels shall be as near the surface as is practicable; that is, without interfering with sewers, water mains, and other subways. The borings which have been made along the line of Broadway show conclusively that there will be no difficulty in the construction of a tunnel in this manner, and the general sentiment of the people of New York is undoubtedly against a deep tunnel.

The financial aspects of the rapid-transit problem have not yet been discussed by the Board. Its particular duties are the selection of the routes and the general engineering features of the tunnel construction, which are to be recommended to the Board of Aldermen. If adopted by the latter and approved by the Mayor, proposals for the franchise are to be publicly asked, the details of the tunnel construction being left to the successful bidder. There is no doubt that the money for the proposed rapid-transit system will be forthcoming when the plans are sufficiently far advanced. In the mean while the Board of Commissioners is to be congratulated upon the progress already made.

THE DECREASE IN THE PRODUCTION OF PIG IRON.

The statistics published this week in the *Bulletin of the American Iron and Steel Association* show that the shrinkage in the production of pig iron during the past six months has been greater than in any year in the history of the industry in this country. The total production of pig iron in the United States during the first half of 1891 was 3,776,556 net tons, against 5,107,775 net tons in the first half of 1890, a decrease of 1,331,219 net tons or 26 per cent. As the production during the first half of 1890 was very nearly the same as in the last half, a comparison with the latter period would not show materially different results. The falling off in production after the panic of 1873 amounted to 27 per cent., but this was spread over three years, the minimum production being reached in 1876. This comparison more strikingly illustrates the extent of the unparalleled reaction which has been experienced in the iron industry during the last six months; in its face it is remarkable how well prices have been maintained.

There was a falling off in the output of all the iron-producing States except six. These were Massachusetts, Connecticut, Georgia, Texas, Michigan and Colorado, the combined production of which forms but a trifling part of the total. Four of these States produce nothing but charcoal iron, while two, Colorado and Texas, occupy comparatively isolated positions in the market. In all other States there was a decrease. In Pennsylvania this amounted to 636,204 net tons; in Ohio, to 237,568 net tons; and in the nine southern States, including Texas and Maryland, to 166,974 net tons, the comparisons in each case being with the corresponding period in 1890. The decrease in the last-mentioned group of States was proportionately less than in the northern, amounting to but 17·5 per cent., which is plain evidence of the pressure which the southern furnaces have been bringing upon the markets with their cheap iron.

The number of furnaces in blast June 30, 1890, was 339; Dec. 31, 1890, 311; June 30, 1891, 295, a considerable number having blown in during May and June. The stock of pig iron upon June 30, 1891, was 495,102 net tons, against 681,992 net tons at the beginning of the year. The amount of pig iron in warrant yards on the last day of June, not included in the preceding figures, was 45,193 net tons, against 59,289 net tons upon Dec. 31, 1890. Stocks were undoubtedly much smaller three months ago, the fact that the reduction for the six months is not greater being due to the accumulations from the increased production since the settlement of the coke strike. There is nothing alarming in the size of the stocks, however, forming as they do less than one month's supply.

This remarkable decline in the pig-iron production is evidence that the stagnation in the general business of the country has been more serious than has been commonly supposed. Pig iron has been, in the past, called the barometer of trade. This may be true to less extent at present than formerly, yet it is doubtful if there is now another commodity whose market condition is a better indicator of the general business situation than iron. The importance of the metal in all of the industrial arts is so great and its uses are so numerous that financial troubles in any direction are felt to greater or less degree in the iron market.

That this is true in the present case is further proved by the enormous decrease in the consumption and production of steel rails, showing the degree of financial stress under which the railways, the arteries of commerce, have been laboring. The production of steel rails in Pennsylvania, Illinois, and other States in the first half of 1891 was but 579,929 net tons; in the first half of 1890 it was 1,032,658 net tons, showing a decrease of 442,729, or nearly 43 per cent. Similarly the production of ingot steel has fallen off from 2,041,239 net tons to 1,599,096 net tons, or 21 per cent.

At present the indications are that there will be an increased demand for iron and steel during the coming autumn. There is now every probability that the crops in this country will be large this year, while it seems to be certain that those of the great grain-producing countries of Europe will be below the average, and will not suffice for domestic consumption. Large exports from the United States will be necessary, and a general improvement in business may be expected to result therefrom. The iron market will, of course, share in this, and an increased production may, consequently, be looked for during the second half of the year. The shrinkage in the first half has been so great, however, that the total for 1891 is certain to be far below that of 1890. The outlook for the ore producers is very blue. The stocks were very large at the commencement of the year, and prices have steadily declined during the season.

ASSESSMENT WORK ON PLACER CLAIMS.

A correspondent inquires whether there has been any change in the text of the United States law as to assessment work on placer claims, and what is the law on that subject.

There has been no change in the text, but the construction put upon it by the General Land Office was changed by Secretary LAMAR in 1885 so as to require the performance of assessment work upon placer as well as upon lode claims. The opinion of Secretary LAMAR on this point is contained in his decision on the appeal of the Good Return Mining Company, which will be found in Copp's Landowner, vol. XII, p. 214. The Secretary cites as conclusive authority the case of JACKSON *vs.* ROBY (109 U. S. 440) in the United States Supreme Court, which, hesays, "establishes the doctrine that the annual expenditure to the amount of $100 to be done on each located claim, or for its benefit, must be made upon placer as well as lode-claims—a requirement," he adds, "that does not appear to have been heretofore insisted upon by the regulations of the Department." The Secretary accordingly overruled as erroneous the previous circulars of the Commissioner of the General Land Office, and I believe the rule he laid down has been followed ever since by the Department—although, as I have not had occasion to make any recent inquiry, I do not speak with absolute certainty.

Some time ago I studied the subject in connection with a case in the courts, and received the impression that the case of JACKSON *vs.* ROBY does not conclusively establish the view in support of which the Secretary cites it. Unquestionably it lends support to that view; but the point was not, as I remember the case, either prominent in the pleadings or distinctly presented in the argument or essential to the decision.

Moreover, I think the text of the statute is more favorable to the earlier construction which it received from the courts and from the Department, and according to which no minimum amount of annual work was required by the United States from a placer locator. It does not by any means follow that a placer locator could hold his location year after year without doing any work. On the contrary, the silence of the Federal statutes would simply leave the matter to local regulations. And it is not difficult to conceive that local regulations, in the case of placers such as alluvial washings, gulch diggings, bar diggings, and hydraulic mines, might well be left in full control. For these operations depend so largely upon the conditions of the seasons as to make a regular annual expenditure in many instances unreasonable—as, for example, when either the deficiency or the excess of water makes it impossible for a whole year to do any useful mining work. If no local regulations whatever exist, the tenure of a placer locator would naturally be limited by whatever the courts might deem to be the reasonable definition of practical abandonment. But there will always be local regulations of some sort; so this alternative need not be considered.

On the other hand, it should be noted that the United States statutes do not give to the placer locator, as they do to the lode locator, the exclusive right to the surface of his location. Not until, by survey and application for patent, he initiates the actual purchase of the claim, can he assert any such possession. Up to that date, prospectors may search for lodes within his location—provided they do not interfere with his mining operations: and if such lodes are discovered they may be located and held, in spite of his prior location. Such, at least, is my reading of the law. And it seems reasonable to me that, if the placer locator does not receive from the United States that protection of surface title which is granted to the lode locator, he should not be required to make the annual expenditure which is exacted as a condition of such protection from the lode locator.

However, the decisions of the Department and the practice of the General Land Office are law until they are overruled, and individual opinions on the subject have little weight.

With regard to the further inquiry of this correspondent, as to a printed compendium of laws and decisions, I would recommend as a useful outline the "Mining Code," published by Henry N. Copp.

R. W. RAYMOND.

BOOKS RECEIVED.

[In sending books for notice, will publishers, for their own sake and that of book buyers, give the retail price.]—These notices do not supersede review in another page of the Journal.]

Aids in Practical Geology. By Grenville A. J. Cole, F. G. S., Professor of Geology in the Royal College of Science for Ireland. Illustrated, 402 pages. Published by Charles Griffin & Co., London; J. B. Lippincott Co., Philadelphia. Price $3.

A Monograph of the Carboniferous and Permo-Carboniferous Invertebrata of New South Wales. Part I. Coelenterata. By R. Etheridge, Jr., paleontologist and librarian to the Geological Survey of New South Wales. Illustrated, 64 pages. Issued by direction of the Hon. Sydney Smith, M. P., Minister for Mines and Agriculture. Sydney, 1891.

Car Lubrication. By W. E. Hall, B. S., M. E. Illustrated, 66 pages. Published by John Wiley & Sons, New York, 1891. Price $1..

Hewlings' Directory of Steam Specialties and Engineering Appliances. Comprising complete classified lists and alphabetical index to the manufacturers of the articles mentioned. Illustrated, 242 pages. Published by A. J. Hewlings, Chicago, Ill. Price $1.

Report on the Internal Commerce of the United States for the Year 1890. *Part II of Commerce and Navigation.* The commercial, industrial, transportation, and other interests of Alaska, Arizona, California, Idaho, Nevada, Oregon, Utah, and Washington. By S. G. Brock, Chief of the Bureau of Statistics, Treasury Department. Illustrated, 1,174 pages. Washington, 1891.

The Railway Problem. By A. B. STICKNEY. With many illustrative diagrams, 249 pages. Published by D. D. Merrill Co., St. Paul, Minn., 1891. Price: cloth, $2.00; half leather, $2.50.

CORRESPONDENCE.

We invite correspondence upon matters of interest to the industries of mining and metallurgy. Communications should invariably be accompanied with the name and address of the writer. Initials only will be published when so requested.
All letters should be addressed to the MANAGING EDITOR.
We do not hold ourselves responsible for the opinions expressed by correspondents.

"A Typical Case"

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: In the ENGINEERING AND MINING JOURNAL of June 27th, 1891, just received, is a letter from Dr. R. W. Raymond, headed "A Typical Case," and describing the case of certain rock sections the examination of which no one in London would undertake without the payment of a fee, while in the United States it was easy to find a scientific man disinterested enough to undertake the work gratis. The inference naturally drawn from a perusal of that letter and its heading is that men of science in London are as a general rule ("typically") mercenary, while only their confrères in America are actuated by noble and unselfish motives!

I do not think that any distinction can fairly be drawn between scientific men in the two countries as regards self-abnegation and disinterestedness; but if any such difference does exist it is assuredly not in favor of America, inasmuch as a far larger proportion of workers in science in the United States are connected in some way with endowed institutions such as universities, technical colleges, schools of mines, etc., and are therefore, speaking in general terms, *paid* for undertaking research work. In England the professional class is much less developed than in the United States, and a very much larger proportion of valuable original research is done by independent non-official workers, mostly hard-working professional men, who take up the study of some special branch of science in their leisure time—not as a business, but from pure love of knowledge for its own sake.

I have not the pleasure of an acquaintance with Dr. Raymond, but it seems to me highly improbable that he should have intended laying such stress on the contrast, and I hope therefore that he will disclaim any such undeserved imputation against the high character of English men of science. Of course any of the persons who call themselves "professional mineralogists," *i. e.*, dealers in mineral specimens, would charge a fee for any business intrusted to them; but there are in England, to my own knowledge, some fifteen or twenty eminent petrologists, any one of whom would be glad to undertake the examination of rock sections from anywhere in the world as a labor of love, always if introduced to his notice by some responsible person, and generally even for a complete stranger.

HENRY T. COLLINS, A. R. S. M.

TERRAZAS STATION, Chihuahua, Mex., July 3, 1891.

[I am glad to accept the statement of Mr. Collins as to the disposition of English experts, and to assure him in return that in my communication of June 27, I did not intend to bring against them a sweeping charge, such as he deprecates. The "typical" character of the case I stated was in the readiness with which one member of the Institute offered to assist another—not in the refusal of any other persons to render the same service. The facts, however, are exactly as I stated them. Doubtless my correspondent, who was remote from England, was unfortunate in applying for help in the wrong quarter, and the answer he received may not have been "typical." Nevertheless, he did receive it; and it led him to have his rock sections sent across the Atlantic to me.

R. W. RAYMOND.

Why Do Steel-Tired Wheels Wear Flat Less Than Chilled Cast-Iron Ones?

EDITOR OF THE ENGINEERING AND MINING JOURNAL:

SIR: Prominent railroad men assert that steel-tired wheels are much less apt to wear flat than chilled cast-iron wheels. If this be true, what is the explanation?

It has been suggested that the reason is that the chilled iron has less adhesion, *i. e.*, is more slippery than the steel, and hence, when the brake is applied, is more apt to slide along the track and wear flat, while the relatively sticky steel adheres. But, if this be true, one would anticipate that a train equipped with chilled wheels would be stopped much more slowly than one with steel-tired wheels. But does the substitution of steel-tired for chilled wheels thus enable trains to be stopped so much more quickly?

The question is one which interests the metallurgist, as perhaps due to some important difference between the properties of the two metals, a difference which may be of importance under other conditions than those of car wheels.

We can see a possible explanation by going back to the first incipiency of a flat spot, when the wheel, being held fast by the brake-shoe, slides along the rail-top. If the wheel remained perfectly cold, then it should wear less if made of chilled iron than if of the relatively soft steel of which tires are made, and the steel-tired wheel should thus have a more serious flat spot after its first sliding than the chilled wheel. To what extent this difference may be modified by the heating due to the sliding friction, one cannot say.

But if, as its superior hardness indicates, the compressive elastic resistance of chilled iron be greater than that of steel, then we may suppose that when the wheel next revolves and the point *A* (Fig. 1) of the flat spot comes directly beneath the axle and is thus heavily loaded, the load will exceed its compressive elastic limit and the steel will *flow*, and flow in greater proportion to right than to left, because the flatness toward the right slightly diminishes the resistance to flow in that direction, and much the same will occur when the wheel revolves far enough to bring the point *B* beneath the axle, the flow in this case being chiefly to the left. With the rigid chilled wheel, however, this flow can take place to a very limited extent, if at all.

In other words, the softness and readiness to flow which characterize steel should tend to suppress any salient protruding points, including those formed at *A* and *B*, the edges of an incipient flat spot, while the rigidity of chilled iron should make the flat spot persist.

It is easy to see why a flat spot, once started, should tend to grow. First, each time the wheel revolves it hammers down upon the flat spot with a vertical fall equal to the versed sine of the angle *A C B*. Then, the next time the brake is applied and the wheel gradually ceases revolving, it will tend completely to stop revolving with the flat spot on the rail. For (Fig. 2) when this flat spot is on the rail, then, in addition to the resistance to the revolution of the wheel which the brake-shoe offers, we have the further resistance of gravity. For if the wheel revolve farther, it and its axle and the weight resting on them must now be lifted a distance equal to *D E*, the versed sine of *A C B*.

If, now, it be true that a chilled wheel tends to wear flat more than a

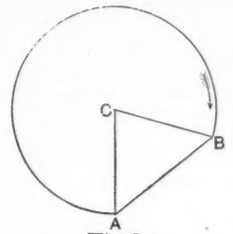


Fig. 1

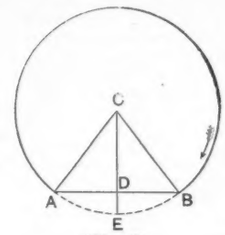


Fig. 2

steel or steel-tired wheel, is it not a serious thing, not only as regards the depreciation of the rolling stock, but as regards the wear of the rails? Must not the edges *A* and *B*, even of those slight flat spots which escape observation, go on indefinitely digging into the rail-head, giving it two stabs for each little flat spot and for each revolution? And should not each stab not only directly abrade powerfully, but, by locally loading the surface of the rail-head so far beyond its elastic limit, leave it more friable, more subject to subsequent removal by abrasion?

JULY 14, 1891. ZEN BRINUS LYON.

THE COLORADO DESERT LAKE.

Acting-Secretary Chandler of the Interior Department recently received a letter from Wood McKnight, at Riverside, Cal., calling attention to a report that the Southern Pacific Railroad Company is about to attempt to stop the overflow of the Colorado River, which has formed a new lake in Colorado desert, the property of the company being placed in jeopardy, and requesting that the department intervene in the interests of the people of Southern California, whom it is presumed the new body of water will greatly benefit. Mr. Chandler has replied that the matters referred to are not within the jurisdiction of the department, and that the remedy of the people against any actual or anticipated injury from the operations of the railroad company in protecting its property lies in the courts.

Major John W. Powell, director of the United States Geological Survey, who was in New York on the 21st inst., gave a reporter of the *Times* some interesting facts about the new lake.

"The traditions of the Indians are by no means the only evidence that this basin has been filled, wholly or partially, before," said Major Powell. "Since the delta was formed and that portion of the Gulf of California was cut off and left to evaporate under the terrific heat of the sun, the Colorado has been playing pranks of this sort on several occasions. Along the hills which form the sides of this basin there are shore marks which indicate that at different times the basin has been flooded to different heights, and then, when the river cut back through its old channel, evaporation has again changed the lake to a parched desert. Along these shore lines shells have been found which confirm this theory. The action of the Colorado in cutting new mouths for itself and then stopping them up is comparatively rapid because of the quantity of silt which the stream carries. It is not unlikely that the supposed traditions of the Indians are facts within the memory of some of the older ones of the scattering bands that live on the hillsides along the basin, for indications are that the valley has been inundated within 50 years, and certainly it has been at least once or twice since this continent was discovered.

"There is no immediate danger of the basin being filled, because it requires a large volume of water to fill it to the river level, and the evaporation is something wonderful. At the present time, according to reports, only a fraction of the water in the Colorado is flowing through this new outlet. It is possible that the channel may be enlarged as the stream continues to flow through it, so that all the water in the river will pour into the basin. Even if that were to happen the evaporation is great enough to take up fully one-half of the Colorado as it spreads over the basin, and it would probably require from two to three years for the balance to fill the hole up to level. At such times as the river filled the basin to its level the flow to the Gulf of California has been through a channel which begins at the lower end of the basin, and makes a short cut directly south to the salt water. This is called Hardy's Colorado, and it is usually simply a dry channel or ditch. It may have been formed under circumstances similar to those existing at present. It is large enough to accommodate the entire volume of the Colorado after the evaporation which is sure to take place while the water is spread over the basin.

"Some idea of the terrible heat may be had from the evaporation which takes place. If the basin were filled to the river level, the lake would present a surface of about 1,600 square miles. This would be lowered at the rate of six feet a year by evaporation. The salt which is now being mined at Salton was deposited in the valley by the previous evaporations. The original salt deposit from the water which was a part of the Gulf of California is not responsible for all that is found there. The waters of the Colorado are saline, for the river flows through beds of rock salt at places many miles up from its mouth, and the successive deposits from the waters of this river as they have flooded the valley and then dried up have added largely to the original deposit."

The New Thames Water Tunnel.—The Vauxhall & Southwark Water Company, of London, has just built a tunnel 9 ft. in diameter, beneath the Thames at Kingston, in remarkably short time, it having been constructed in nine weeks. The roof of the tunnel is only 3 ft. below the water in the river bed. The material pierced was clay, and the system employed was that of laying iron plates behind a circular shield.

NOTES ON THE MANGANESE-ORE DEPOSIT OF CRIMORA, VIRGINIA.*

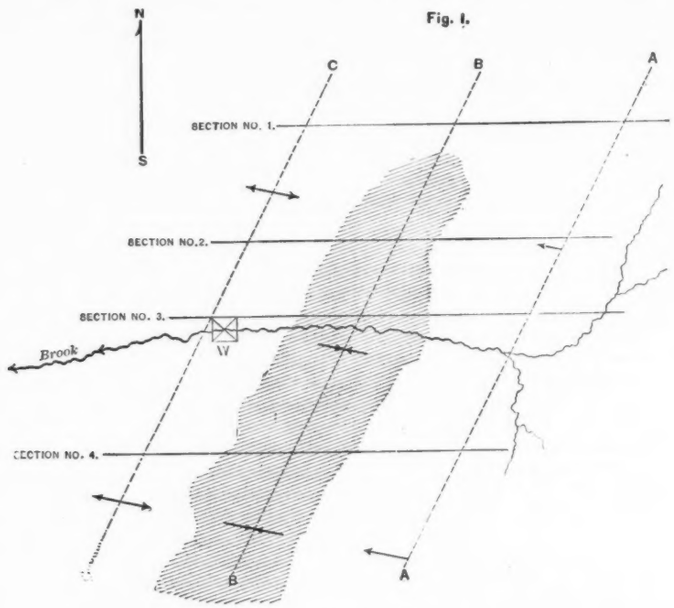
By Charles E. Hall, Chicago, Ill.

The Crimora mine, operated by the American Manganese Company, Limited, is located 2¼ miles east of Crimora station, on the Shenandoah Valley Railroad, in Augusta County, Virginia. It is situated in a basin at the western base of the range of mountains which flanks the Shenandoah Valley on the east. This range is composed of the Potsdam sandstone (No. 1 of the Pennsylvania survey), and extends in a northeasterly-southwesterly direction the entire length of the valley. The general dip of the measures is westward. The massive sandstone of the mountain is geologically overlaid with shales or slates which belong to the Potsdam, or lie between it and the Lower Silurian limestone. Throughout this region these shales are decomposed, and form more or less extensive clay deposits, which are found along the base of the range, and often underlie a considerable area to the westward of the abrupt slope of the range. Sand and fragments of quartzite occur in considerable quantities on the surface, and often conceal the true character of the underlying formation.

The area containing this ore deposit extends northeast and southwest, and is flanked on the east by the main range and on the west by a sharp anticlinal flexure of the sandstone, which, to the north of the ore deposit, forms a prominent spur of the range.

In the accompanying illustrations, Fig. 1 is a ground plan of the immediate vicinity of the mine. The line *A A* is the general line of axis of the monoclinal of the Potsdam sandstone, with westward dip. *B B* indicates the synclinal axis, which sinks rapidly to the southward. *C C* is the line of the anticlinal of the Potsdam. Near the center of the figure is indicated a brook flowing from the monoclinal ridges of the Potsdam on the east and crossing the synclinal basin and also the anticlinal fold *C C* to the westward. *W* indicates the location of the ore washer. The sections, Nos. 1, 2, 3, and 4, Fig. 2, are taken on lines indicated by the respective numbers in Fig. 1.

Fig. I.



CRIMORA MANGANESE ORE DEPOSIT.

It will be seen from Fig. 1 that east of the mine there is a large area drained through the brook which crosses the ore basin. This drainage area is principally within the Potsdam sandstone belt. The brook leaves the synclinal (ore-bearing) basin at the point where the Potsdam anticlinal fold, indicated in the sections by *C*, sinks below the surface. It will be seen from the sections, Fig. 2, that the axis *C*, as well as *B*, rapidly sinks to the northward.

The clay resulting from the decomposition of the shales has been preserved within this sharp synclinal. In section 1 scarcely any clay appears, while between sections 3 and 4 more than 300 ft. of clay has been penetrated in boring for ore. The shaded portion of Fig. 1 indicates the ore area, which extends irregularly northeast and southwest with the axis of the basin. The distance across the basin is one-fourth of a mile. The drainage area of the brook, west of the basin, is fully 10 square miles.

The fold *C*, section 3, forms a complete dam, back of which the seepage water is held until it can slowly work its way through the sandstone of *C*, or southward and past the end of the sinking anticlinal axis.

Black oxide of manganese occurs in the Potsdam sandstones of this region in greater or less amount. It is often noticeable as a black stain on the rocks or as minute specks or particles throughout the mass. No workable bodies of this ore have been found within the Postdam sandstone, so far as I am aware.

There are no limestones west of, or in proximity to, the manganese-ore deposits of Crimora which could give origin to the ore; and I am therefore forced to the conclusion that the ore in this case originates from the Potsdam sandstone, where it exists disseminated throughout the rocks. The water draining from the mountain area east of the clay basin carries the mineral with it in minute quantities, and redeposits it in the clay which fills the basin *B*. This argument is favored by the fact that the largest and best deposits of ore have been discovered directly beneath the course of the brook and immediately upon its entrance to the clay area.

The ore is found in irregular bodies in various parts of the clay mass, and I am unable now to say what are the most favorable conditions for its deposition. Clay seems to be essential to its formation or redeposition. It is seldom found in sandy ground, and, when it is thus found, one is led to the belief that clay originally formed part of the mass, and has been subsequently washed out. A piece of sandstone imbedded in clay will sometimes become so much impregnated with the black oxide of manganese as to be in fact a siliceous manganese ore. To my mind it appears that the water, laden with its particles of manganese minerals, becomes retarded upon reaching the clay mass, and a separation takes place more or less rapidly. The rate at which this separation or redeposit takes place is difficult to estimate, but it is undoubtedly going on at the present time. Where the water is kept artificially drained from the mines we cannot look for the natural conditions to exist; but if the natural conditions are permitted to return, the formation of the ore will continue.

There appears to be no ratio between the percentages of phosphorus and iron in manganese ore. In cases where the iron percentage is low, the phosphorus may be high, and *vice versa*. I will therefore not attempt to enter into any genetical explanation; nor am I prepared to generalize on the subject of manganiferous ore deposits. The facts which I have endeavored to explain apply to the deposit in question, and may not be applicable to any other. Similar conditions, however, may exist in other sections; and it would be advisable for those interested in prospecting for manganese ore to bear in mind the geological features which I have found here.

* Presented at the Cleveland meeting of the American Institute of Mining Engineers, June, 1891.

The Donald's Chlorine Company, Limited, which was organized last December to manufacture chlorine by the Donald process, is constructing works at Kilwinning, Scotland, and anticipates that they will be in operation early in the autumn.

The Relations of the Eastern Sandstone of Keweenaw Point to the Lower Silurian Limestones.—Mr. W. L. Honnold, one of the assistants of the Michigan Geological Survey, has been engaged, says Dr. M. E. Wadsworth, in *Science*, in the study of the relations of the limestone west of L'Anse to the eastern or supposed Potsdam sandstone of the copper-bearing range. This locality is described in Jackson's report (1849, pp. 399, 452), Foster and Whitney's report (part 1, 1850, pp. 117–119), and in Rominger's report (1873, I, part 3, pp. 69–71); and the limestone considered from its fossils to be Trenton or some adjacent Lower Silurian strata. It was inferred by Jackson that the limestone underlies the sandstone, but by the other observers that it overlies it, although no direct contact was seen. Excavations made by Mr. Honnold's party and reported by him have developed the contact of the two formations, and show that the two form a synclinal or oblong basin-shaped fold, with the limestone overlying, and in direct contact with the sandstone. The existence of this fold in the sandstone, as well as in the limestone, removes the difficulty previous observers have had in reconciling the obviously tilted limestone with the supposed horizontal sandstone, and proves that the eastern sandstone exposed here is of Lower Silurian age, and older than this limestone. At the point of contact of the two formations, exposed by excavation, the sandstone and limestone appear to be conformable, and they are seen to constantly agree in dip and strike. The contact between the two formations is abrupt, without any beds of passage, although the upper layers of the sandstone contain considerable carbonate of lime and magnesia, and the lower layers of the limestone much silica. These observations are considered to be confirmatory of the commonly received view of the Potsdam age of the eastern sandstone; while the contorted state of the sandsone, extending at least a mile and a half west from the limestone locality, may have weight in deciding the relative age of the eastern sandstone and the copper-bearing rocks.

ABRASIVE PROCESSES IN THE MECHANIC ARTS.*—I.

By John Richards, San Francisco.

WET STONE GRINDING.

Abrasive cutting is performed by means of wet stones, sand, emery, glass corundum, crocus, rouge, chilled globules of iron, and in some cases by soft, friable iron alone. Chief among these methods is that of wet stones, or common grindstones, which form a more important part of converting implements than is commonly supposed.

It is common to consider a grindstone as a kind of simple contrivance for rough work, not involving any operative conditions worth considering, but this is a great mistake. It is true, that in sharpening tools and other operations where an indefinite amount is cut away, and the material is held in the hands, or applied by yielding pressure, the operation is simple enough, but as soon as gauge or positive grinding is attemp ed we have a totally different process, one involving intricate and difficult conditions that a century of endeavor has not put into a scientific or even understood form.

In proof of this let me point out that if a wet stone grinding machine for exact dimensions is wanted, there is, perhaps, not a firm in Europe or America where such a machine can be ordered without supplying plans for it, nor is there, outside of the factories where such machines are developed, any knowledge of the processes that will permit the construction of such machines.

GAUGE GRINDING MACHINES.

Before proceeding to consider gauge grinding machines it will be proper to mention that they are not exceptional. Saws of all kinds, from the tiny web, one eighth of an inch wide, up to the huge circular saw, 6 ft. in diameter, are all gauge ground by machinery on wet stones. Some of these machines cost many thousands of dollars, and on this process more than any other does our modern manufacturer of saws depend. Carpenter's steel squares, files of all kinds, smoothing irons, spindles, gun barrels, and in some cases small shafts are *gauge* ground. The nearest organized works I have known at which gauge grinding machines were manufactured were those that existed twenty years ago at Cohoes, N. Y., where an ingenious mechanic, by the name of Blake, constructed wet stone machines for various kinds of work. I visited his works in 1865, when he was engaged in constructing machines for grinding files, squares and other kinds of tools. Since that time, and especially during the ten years that succeeded, Mr. Baker, of the Disston Works in Philadelphia, Pa., developed a great deal that was new in grinding, discovering certain rules or principles that in some degree gave promise of a more scientific understanding of the processes.

Mr. Baker, who is better known here as the inventor of the blowing machines that bear his name, is, perhaps, the greatest expert now living in the art of wet grinding. He is also a mechanic of eminence in many other branches, but wet stone grinding, he claims, has presented the most difficult problem he has met with in the Disston Works, and in other large works of an analogous kind where he is now engaged, if living.

Mr. Blake, before mentioned, removed to England, where, I am informed, he now carries on an extensive business in grinding for the trade. His method consisted of an endless platen, or chain of platens, revolving in front of the stones, the plates or tables being guided as they passed the point of contact, so as to present the pieces in various positions, they being fastened on the plates by means of clamps. The difficulty encountered, and the main one presented in all kinds of wet stone grinding, was the rapid wear of all rubbing or running parts.

The endless platen method has gone out of use unless yet practiced by Mr. Blake himself, and present methods are by means of carriages mounted on wheels, the axle bearings of which can be protected, and by means of radius frames that swing from a pivot. This latter is applicable to forms of any kind that can be bent to suit the curve and thus be ground parallel.

CONDITIONS OF GAUGE GRINDING BY WET STONES.

Among the conditions of gauge grinding by wet stones may first be mentioned the arc in contact. This cannot well exceed three-eighths of an inch, even for large stones, and where there is a flood of water. This may seem a strange proposition, but it is the rule adopted by Mr. Baker, and is fully confirmed by my own experience. It is true that a plane, meeting a circle, presents but a point of contact, but even a small film cut away, as the work is moved along, presents this amount of contact, especially with large stones, and as soon as that area is exceeded water is excluded, the pores of the stone fill with metal, the work is heated and either spoiled or "pulled" out of the machine.

In a machine I constructed, about 1886, using stones 6 to 7 ft. in diameter and 12 in. thick, consuming 40 H.P. to each stone, we frequently threw the pieces out by heating. Plane irons 2 to 3 in. wide, averaging one-quarter of an inch in thickness, would be curled up like a wood shaving, turned blue, and fired into a wall like projectiles from a gun.

As a rule, the narrower the line of contact the better, hence the radius carriages that present a curved surface opposed to that of the stone, work best for thin, flexible pieces.

About the same time I constructed another machine of smaller size for billet web saws, in which the pieces were fed through continuously, by means of rollers, and found that even with soft stones there were continued heating and danger, until a reversely curved bed was placed opposite to the stone so as to reduce the arc in contact, which in that case could not much exceed three-sixteenths of an inch.

The difficulty in such cases is either the absence of water or else the filling of the interstices of the stone. It is difficult to tell which; in fact, as before remarked, the whole process is a mystery, as far as observation goes. One has to deal with "symptoms."

A second condition is the element of elasticity. What this has to do with grinding is by no means clear, but it is an essential feature. I mean moderate elasticity, because any yielding that would permit a stone to wear out of "truth" would spoil all.

In the large machine first mentioned for grinding plane irons, the bed or carriage was 8 ft. long and 16 in. wide. It was of iron about 4 in. thick, and with its mounting weighed over a ton. It was moved by rack and pinion gearing placed in a room separate from the machine, to preserve the machinery from grit. The platen received eighty common plate irons, laid with steel on one side and tempered hard. The first experiments were discouraging, but it was soon found that a pine board 1 in. thick, placed between the table and the work, prevented the difficulty, unless the stones were too hard.

In most cases the elasticity due to wood framing, or tables mounted at the ends only, is enough, but there must be elasticity from some source.

The third condition I will notice is the hardness of stone. A hard stone cannot be used at all for gauge grinding, and the softer a stone is the better it will work; but there is a commercial limit in the case, because soft stones soon wear out. The advantages of a soft stone I conceive to be in the fact that the rapid wear presents continually new and sharp edges; also the water saturation because of porosity is more complete. The function of continued waste or wear will be further noticed in connection with emery wheels, or corundum wheels.

There are many cases where gauge grinding with stones has been attempted and abandoned, after expensive experiments, because the stones used were too hard or too fine. Indeed, most of the difficulties that have come under notice have been due to this cause. In some cases a lack of water has been the cause of failure. It is not enough to flood a stone with water, especially one running at high speed. The water must be shot in by a jet between the stone and the work, and distributed all the way across the face. The agency of the water is to carry off the heat, and also to wash out the sand and particles of metal cut away.

The principal development of wet stone grinding, that is, gauge grinding, has been in the large saw manufactories, and also tool factories. I do not mean hand grinding, which is simple enough and calls for no notice; but gauge grinding has been the subject of a great amount of ingenious effort in these manufactories by highly skilled mechanics who have not carried their knowledge beyond the works where it was applied.

In England a good many cemented or manufactured stones or wheels are used for wet grinding. At the works of George Richards & Co., Manchester, such stones or wheels are used for grinding wrought-iron pulleys, and a careful account of expense and time shows a saving over natural stones, although the latter are much cheaper in first cost.

The stones employed are, at the beginning, about 4 ft. in diameter and 6 in. thick. I am not aware of the kind of cementing material used in their manufacture, but it is in a limited degree soluble in water.

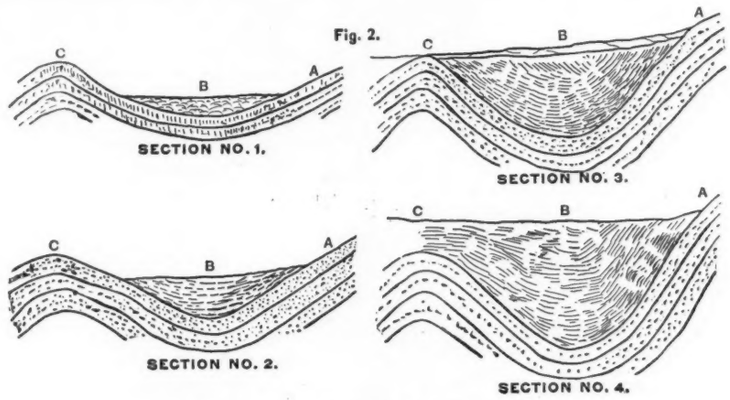
DRY STONE GRINDING.

There is but little dry grinding done in this country, and so far as known only on stones brought here from England.

It may have been noticed that the shanks of tools brought from England, chisels for example, are ground crosswise and are very rough. This is done on small stones driven at high speed, called "shank stones." They were formerly employed for the same purpose at the Barton Wool Works, in Rochester, New York.

Their operation is apparently the same as that of a coarse emery wheel, and the mystery is that they do not "glaze" or fill with metal; but there

Fig. 2.



CRIMORA MANGANESE ORE DEPOSITS.

* Extract from a paper read before the Technical Society of the Pacific Coast, Feburary 6th, 1891.

is some peculiarity in their structure that keeps them clear. I imagine they would soon fill if applied to gauge or positive grinding.

A stone when glazed or filled ceases cutting or abrading, and some kinds, granite for example, are suitable for the bearings of shafts. I have myself seen in several cases in Sweden the main or water wheel shafts of saw mills mounted in granite bearings, and in one case had a shaft lifted to examine the surfaces, which were polished and had a metallic appearance.

The tendency to "pull," as it is called, in dry grinding or in common grinding, when a stone becomes too dry, is a phenomenon not easy of explanation For example, if we have to turn off a grindstone, either in its manufacture or to make it true in use, a hard or sharp implement is of no avail. It must, on the contrary, be of soft iron or steel, and held in a dragging position on the face of the stone. A piece of common gas pipe is often used for this purpose.

When the tool takes hold, which it will not do unless the conditions are right, it will "hang on," tearing out a deep furrow and apparently cling to the stone Only a blunt end is required, and, strange to say, complete elasticity is essential.

For this purpose it is common to use a steel rod, large enough to be held in the hands, five-eights to three-quarters inches in diameter, but the cutting end is drawn down to three-eights inches square, a slender rod which bends freely when it takes hold of the stone. All this, so far as is known, is unexplained phenomena, familiar to shop practice as a fact, but a mystery so far as the nature of the operation is concerned.

In this same connection, but not to anticipate what is to be said of rolling abrasion, I will mention another method of truing or turning stone by means of rolling implements, that "force off" the material by pressure.

A small beveled wheel with a dull edge is presented to the face of the stone in a diagonal position, so as to rotate slowly with it, and is passed positively across the face, "spawling" off the irregularities in pieces at one operation. The same operation is the most successful one for shaping stone by machinery that has ever been invented, and will be treated upon in a future place.

Unless these facts suggest some explanation of why stones do not glaze or fill in dry grinding, I have none whatever to offer.

Dry grinding is not uncommon in England. Razors for one thing are dry ground, and I believe also many other implements of the kind that would be injured or destroyed by the heat which would naturally be supposed to result from that process.

ABRASIVE CUTTING BY HEAT.

This operation consists in applying smooth disks of steel or iron, driven at high speed, to pieces to be cut, the heat developed by friction being sufficient to melt the metal in contact with the wheel, or, what is more profitable, softening to plastic state, so it is rubbed or worn away by the wheel.

This operation has a place in what may be called the romance of processes. Most every one has heard of it and wondered at it, but I imagine no one has ever seen any very useful function performed by this means.

In a tolerably wide observation of manipulative processes in this and some other countries I have never seen this process but once applied in a manner or under circumstances that seemed necessary or economical, and that was in the United States Armory at Springfield, Mass., where it was employed in preparing a tenon or reduced section on the ends of tempered steel ramrods, such as were used in loading the muskets of twenty-five years ago.

The material was hard and could not be cut, so small wheels of iron about 6 in. in diameter and 1 in. thick were used. They were driven at 6,000 revolutions per minute and melted or abraded the metal instantly, at the same time drawing the temper so that a screw could afterward be cut on the end of the tempered rod.

My own experiments have been confined to cutting off small bars of round and square iron by means of disks 12 in. diameter of 16 gauge plate. The operation was slow, unsatisfactory, consumed a great deal of power and left the surfaces with a hard scale that afterward destroyed files or other tools.

I have also seen railway bars cut off by this method, the saws being about 4 ft. in diameter and five-sixteenths of an inch thick, but so far as known all these operations have been supplanted by cold sawing with regular saws having sharp teeth and cutting the same as a circular or band saw does in wood.

COLD SAWING IRON AND STEEL.

In respect to this last operation of cold sawing iron and steel I will digress enough to say that it is a process of great importance that has been at least ten years in making its way to this country. Five years ago there was scarcely a large engineering works in England that had not among its implements either circular or band-sawing machines for metal, and in many cases both.

Messrs. Cramp & Son, the shipbuilders at Philadelphia, three years ago ordered from England two of these cold saws for cutting off deck beams and other bars, and one is in use at the Union Iron Works in San Francisco. The United States Government, about one year ago, ordered from a firm in Leeds, England, a band-sawing machine for cutting metal at the Washington Ordnance Works. I know of a works in England where there are fifteen such machines in constant use.

The manufacture of cold sawing machines has now been definitely commenced in Philadelphia, but it is a tardy beginning, considering their extensive use abroad in England, Germany, and France five years before.

ACCURATE GRINDING.

Grinding is the process of accuracy. I have explained how it was the only process of treating hard material, from tempered steel to the diamond, but an equally important function is the one of accuracy. Considering abrasive cutting as one of delicacy or precision, direct cutting is in comparison only a "roughing out" or preliminary process.

In metal working the operation of cutting has a limit of accuracy at one hundredth part of an inch in coarse work and two hundredth part in fine work. I mean in common turning and planing. In grinding, the range of accuracy comes down to the ten-thousandth of an inch in common operations, and much less in the finer operations. All accurate and all polished surfaces are finished by abrasive operations, and after this statement it may be perceived how these processes are more important than cutting with edges.

In the manufacture of gauging implements of precision, with which I was connected for many years, grinding processes opened a new field. It was at the beginning of what may be called the emery-wheel period, but involved a great deal more than common grinding processes, and a good deal that is never learned in any manufacture not involving dimensions within a five-thousandth part of an inch. I do not, however, propose to go into this matter at this time, the purpose being to explain, or comment upon, some of the phenomena that attend on accurate grinding by wheels.

The manufacture of emery grinding wheels as now carried on is not what it should be. A dozen or more companies are making and recommending their particular wheels as superior to all others, but as to how these wheels are cemented or made there is no knowledge whatever. As a matter of fact, there are certain kinds of cutting material and certain kinds of cementing material that are best for particular processes, and it is certainly time this were a matter of common knowledge among mechanics and manufacturers. The requirements demand a very wide range of quality in such wheels, and there should be something more reliable to depend upon than the trade secrets and circulars of makers.

While the attempts to grind caliper and other gauges already alluded to were being made, Prof. John E. Sweet, of Cornell University, came to the works, and as an act of disinterested kindness placed at our disposal the knowledge he had gained in several years of experiment in accurate grinding at the laboratory of Sibley College. This information, although valuable and expensive, was discouraging, in the fact that his conclusions were that abrasive grinding could not be done without pressure, and with pressure accuracy was impossible, except as a "trial" process.

Let me explain here that trial operations are not admissible in any organized process for the duplication of work. One may "cut and try," and thus secure accurate dimensions, but this is not manufacture, in a commercial sense, for our time at least, and was not applicable to standard gauges. Implements so made would cost a great deal, and would be of no commercial use for that reason. In the duplicating system of making small arms, for example, if any part is touched by a file, or any implement that is hand guided, that piece is lost. It becomes special. In Geneva, twenty years ago, when watches were made by hand and trial fitted, such watches could not compete with those made here when the rate of wages was ten times as much as in Geneva. Trial work is of no use in the accurate fitting of any article to be reduced to a manufacture, so that Prof. Sweet's conclusions were discouraging. Thousands of dollars' worth of gauges and machinery were made and lost at the gauge works, until light came from an unexpected source. I am speaking of twelve years ago.

Some years previous to that time J. Morton Poole, of Wilmington, Del. introduced a system of accurate grinding for calendar rolls for paper making. These rolls, some of them 7 ft. in length, had to be made for rolling tissue paper, which will pile 2,000 to 4,000 to an inch of thickness, and variations of one ten-thousandth of an inch in diameter or alignment would distort the paper as it passed through the rolls. Mr. Poole had exhausted the emery wheel market, as we had done, and ended by advertising here and in Europe for samples of emery and corundum. He collected such samples and established a laboratory for experiment and the manufacture of wheels, and, finally, after many failures, produced those that would grind without pressure.

This was done by cementing the wheels with substances soluble in soda water, using the sharpest corundum carefully assorted. When the wheels were at work a stream of alkaline water was run upon them, so the surface was continually but slowly melted away, and each time the wheels turned around, so to speak, new edges were presented to the work, and when the conditions were favorable the cutting went on without appreciable pressure. This was the lacking feature, and through his skill and suggestions the gauge business succeeded.

Let me explain respecting pressure, that the flexure and yielding joints in the most carefully constructed machine, even under light pressure, are enough to destroy the accuracy of these processes, and also, as flexure is accompanied by heat, the distortion from that cause is a further difficulty. The same rule applies in all accurate abrasive grinding, and quite the reverse of what has been noted of wet stone grinding. Pressure always produces flexure and distortion.

(To be continued.)

The Manufacture of Soda Crystals.—H. Schreib describes in the *Chemiker Zeitung* a new process for the manufacture of soda crystals, which consists essentially in aiding the separation of the soda crystals from the hot concentrated solution by means of artificial cold. The method, which is of Danish origin, has been in operation at Copenhagen for a considerable time at a works making 20,000 kilos of soda crystals per day. The crystals formed in this way are small in size, but are of the same purity as the large crystals. The process can be conducted continuously throughout the summer months, which is a decided advantage.

Production of Arsenic in Cornwall and Devon.—There are now in Cornwall, according to the English "blue book," 15 mines engaged in the production of crude and refined arsenic, of which the most important are Callington United and the East Pool, the latter being largely productive of tin also. Callington United produced in 1890 1,117 tons, of the value of £12,283, and East Pool 612 tons, of the value of £4,278. Drakewalls also produced a fair quantity, namely, 502 tons, of the value of £4,256. The production of crude and refined arsenic in Devonshire is much larger than in Cornwall, being 4,133 tons, of the value of £34,224. There are but three mines there producing crude and refined arsenic—Devon Consols heading the list with 2,615 tons, of the value of £28,523; Bertha Consols 964 tons, of the value of £1,271; and Gawton, 554 tons, of the value of £4,430. The total production for 1890 was 7,276 tons, of the value of £60,727, which compares favorably with the previous year, namely, 4,758 tons, of the value of £38,260. Of arsenical pyrites the production was 5,114 tons, of the value of £4,414, but the total for the preceding year was much larger, being 7,688 tons, of the value of £7,317.

PROMINENT MEN IN THE MINING INDUSTRY.

Milan C. Bullock.

It is the boast of American mining engineers that notwithstanding the higher cost of labor and supplies in the mining districts of this country than in the older ones of England and the Continent, mining work can generally be done in a far more economical manner. This is due in part to the greater efficiency of American labor but mainly to the labor-saving devices of American inventors, in the introduction of which our manufacturers of mining machinery have played the principal part. Mr. Milan C. Bullock, whose portrait we present this week, has been closely identified with these interests for more than twenty-five years, and may, consequently, be appropriately selected as a representative of this branch of the mining industry.

Mr. Bullock, who was born in Granville, Washington County, N. Y., June 26th, 1838, comes from stout old Puritanical stock, the first of the family in America receiving a royal grant of land, covering the whole of the present township of Stonington, Conn., as a reward of valor. Mr. Bullock was brought up on a farm in his native place, where he worked until he was 18 years of age, after which he served an apprenticeship with a miller to learn the trade, but was finally compelled to abandon it on account of ill health. When the civil war broke out he promptly enlisted, but was rejected on account of asthma, from which he was suffering at that time.

At the age of twenty-four, Mr. Bullock bound himself as an apprentice to learn the trade of a machinist, and entered upon this work with such firm determination to go to the front that he made unusually rapid progress. He was promptly rewarded for his energy and ability by promotion, and when he had served but eighteen months was made foreman of a shop employing from 35 to 40 men.

After serving his full time as apprentice, Mr. Bullock commenced changing from shop to shop for the purpose of learning "shop wrinkles" and getting wider experience, his unvarying good nature and persistent push always gaining him friends among shopmates and employers. During this time he worked in machine shops of all kinds, from Massachusetts to Missouri.

In 1866 Mr. Bullock entered the employ of the Steam Stone Cutter Company, of Rutland, Vt., manufacturers of the "Wardwell Channeler," and remained with it for two years, when he became connected with the old Windsor Armory Company, of Windsor, Vt., which was then engaged in manufacturing diamond drills and channeling machinery, where he undoubtedly gained the particular experience which has subsequently become of so much value to himself and the mining industry in general.

In 1870 Mr. Bullock was engaged as superintendent of the Pennsylvania Diamond Drill Company, where he had the honor of putting down at Phenix Park, under the most trying and discouraging circumstances, the first really deep hole ever put down by the use of a diamond drill. While engaged with this company he made and patented a number of important improvements on diamond drills, and in conjunction with Jacob Shelby brought out and patented the "Long-Hole Process" of shaft sinking, made famous by that eminent and lamented engineer, General Henry Pleasants, who (when other mining men were calling Mr. Bullock "that crazy Yankee crank") at once recognized its advantages and had the courage to accept and adopt Mr. Bullock's plans, which were at once applied in sinking the two East Norwegian shafts, near Pottsville, Pa., to a depth of 1,685 ft., with remarkable rapidity for that time.

Mr. Bullock designed and made all the working drawings for the drill machines used in sinking these shafts, in five days and nights. The speed of sinking, which was then considered phenomenal, ranged from 80 ft. to 130 ft. per month, as against a speed of 20 ft. per month in sinking the Wadesville shaft through the same measures.

After building up a very satisfactory business for the Pennsylvania Diamond Drill Company, Mr. Bullock was offered and accepted, in the fall of 1871, the position of general superintendent of the American Diamond Drill Company, of New York. His first work for this company was to introduce the diamond drill at Hell Gate, New York harbor, where it was used so successfully by General Newton in exploring ahead of the work in the tunnels, headings and chambers. Mr. Bullock also introduced the diamond drill for prospecting purposes among all the leading mines and quarries of the Eastern States, overcoming all the numerous difficulties which he encountered. He also designed many new and novel forms of drills used in submarine blasting, ventilating mines, etc.

In the fall of 1873 Mr. Bullock superintended and built the plant used by the late Henry Meigs, of Lima, Peru, in driving the famous Mt. Aroya tunnel through the Andes at a height of nearly 14,000 ft. above the sea level, this being at the time the highest tunnel in the world.

In the summer of 1874 the American Diamond Drill Company failed, having lost a great deal of money in outside speculation, and in going down ruined Mr. Bullock financially. Nothing daunted, however, he began again and aided in reorganizing the company as the present American Diamond Rock Boring Company. Owing to some friction in the management of this concern Mr. Bullock resigned in July, 1875, and went to Chicago, where he engaged in business on his own account with a capital of only $600, and that borrowed money. For the first three years he found his undertaking "an up-hill row to hoe," but his energy and indomitable pluck won, and in 1878 he commenced the business of the M. C. Bullock Manufacturing Company with a force of two men and a boy, and about $1,800 worth of tools and fixtures. Aiming at a high standard of excellence both in design and workmanship, and determined that nothing but strictly first-class work should leave his shop, he found it difficult to compete with cheap-made Western machinery, but perseverance and a strict adherence to his rule have brought success, and in twelve years his working force has grown to nearly 200 machinists, besides pattern makers, blacksmiths, foundrymen, etc.

MILAN C. BULLOCK.

The M. C. Bullock Manufacturing Company, of which Mr. Bullock is the founder and president, has a world-wide reputation, and not only has a very large trade in this country but also a growing foreign trade, shipping its specialties in mining machinery to all parts of the world. The most of the company's machinery is made interchangeable by use of special tools and appliances, and the workmanship is so perfect that the company is often called "the Pratt and Whitneys of the West." There is scarcely a mining camp in the United States where the famous diamond drills of the company are not to be found, and the service which these efficient machines have done in prospecting work has been of inestimable value.

Personally, Mr. Bullock is a most interesting person. He is a rare combination of the able man and the good fellow. His popularity is universal, and he always seems to be as happy and companionable among young men as among those of his own age. In appearance he resembles the evangelist Moody so much that he has frequently been mistaken for him on the street. His invariable reply to the salutation, "How do you do, Mr. Moody?" is "I am not moody by name or nature." Everywhere that he has gone during his long and active career Mr. Bullock has made friends, and it is an evidence of his own personal worth that he has always kept them.

The gold produced in Venezuela in 1890 amounted to 2,424 kilos 525 grammes; value, $1,040,506.

WORLD'S PRODUCTION OF GOLD AND SILVER—PRICE OF SILVER AND RATIO OF GOLD AND SILVER.*

By R. P. Rothwell.

A study of the accompanying table and the diagram of the world's annual production of gold and silver, and the price of silver from 1850 to 1889 shows that the world's gold production from 1850 to 1857 remained nearly constant at about $134,000,000, then decreased irregularly till 1883, reaching a minimum of $97,000,000, then increased irregularly to 1889, when the product was $120,000,000.

The silver production remained nearly constant from 1850 to 1860 at above $40,000,000, increasing slowly to 1866 to $52,000,000, then increased steadily and rapidly to 1887, and still more rapidly in 1888 and 1889, to $159,000,000.

The ratio of total value of silver product (at U. S. coining value) to that of the total of both gold and silver remained nearly constant, about 24%, until 1860, increasing irregularly to 30% in 1867, then steadily to 57% in 1889, becoming equal to gold, or 50%, in 1881.

The production of silver and the ratio of silver production to total of silver and gold thus both had a period of slow increase from 1860 to 1867, and then a rapid increase beginning in 1867 and lasting to the present time. The price of silver remained nearly constant (at over 60 pence per ounce standard in London, equal to over $1.32 per ounce fine) until 1872,

MOST PROBABLE VALUES OF THE WORLD'S PRODUCTION OF GOLD AND SILVER. PRICE OF SILVER AND RATIO OF GOLD TO SILVER. COINAGE OF THE PRINCIPAL COUNTRIES.*

Year.	Production. Value in millions of dollars. U. S. coining value. Gold.	Silver.	Total.	Percentage of total. Gold, per cent.	Silver, per cent.	Price of silver in London, pence per ounce standard	Value of silver per fine ounce. Dollars	Price, ratio 1 ounce gold ounces silver.	Coinage in millions of dollars. Gold.	Silver.
1852..	.....	.....	.....	.....	.....	.....	.....	.....	109.0	45.5
1853..	.....	.....	.....	.....	.....	.....	.....	.....	164.0	48.5
1854..	.....	.....	.....	.....	.....	.....	.....	.....	154.0	39.5
1855	132	40	172	77.0	23.0	61¼	1.337	15.42	169.0	19.0
1856..	134	40	174	77.0	23.0	61 5-16	1.344	15.34	176.5	55.0
1857..	134	40	174	77.0	23.0	61¾	1.353	15.27	162.0	67.0
1858..	133	40	173	76.9	23.1	61 5-16	1.344	15.36	188.5	105.5
1859..	130	40	170	76.5	23.5	62 1-16	1.36	15.21	196.0	89.5
1860..	127	40	167	76.0	24.0	61 11-16	1.352	15.30	143.0	98.55
1861..	122	45	167	73.1	26.9	60 13-16	1.333	15.48	135.0	64.5
1862..	119	46	165	72.1	27.9	60 7-16	1.346	15.35	162.5	61.0
1863..	119	49	168	70.8	29.2	61 3-8	1.345	15.38	141.5	63.0
1864..	122	52	174	70.1	29.9	61 3-8	1.345	15.39	167.0	78.0
1865..	126	52	178	70.8	29.2	61 1-16	1.338	15.43	114.0	77.0
1866..	127	52	179	71.0	29.0	61 1-8	1.339	15.44	163.0	106.5
1867..	127	54	181	70.1	29.9	60 9-16	1.328	15.57	105.0	87.5
1868..	126	57	183	68.9	31.1	60½	1.326	15.61	126.5	67.5
1869..	125	61	186	67.2	32.8	60 7-16	1.325	15.60	133.5	62.5
1870..	123	64	187	65.8	34.2	60 9-16	1.328	15.60	83.0	85.0
1871..	119	68	187	63.6	36.4	60½	1.326	15.58	109.5	45.0
1872..	113	71	184	61.4	38.6	60 5-16	1.322	15.64	225.5	39.5
1873..	112	75	187	59.9	40.1	59¼	1.298	15.93	225.0	100.5
1874..	111	79	190	58.4	41.6	58 5-16	1.278	16.16	136.5	67.0
1875..	111	82	193	57.5	42.5	56⅝	1.246	16.63	178.0	103.0
1876..	111	88	199	55.8	44.2	52⅝	1.156	17.80	188.0	116.5
1877..	116	93	209	55.5	44.5	54 13-16	1.201	17.19	194.5	94.5
1878..	120	97	217	55 3	44.7	52 9 16	1.152	17.96	189.0	140.5
1879..	114	99	213	53.5	46.5	51¼	1.123	18.39	105.0	104.0
1880..	108	101	209	51.7	48.3	52¼	1.145	18.06	133.0	97.5
1881..	104	106	210	49.5	50.5	51 15-16	1.138	18.24	131.0	70.5
1882..	100	111	211	47.4	52.6	51 13-16	1.136	18.27	168.5	50.0
1883..	97	115	214	45.3	50.7	50⅝	1.11	18.65	106.0	81.5
1884..	100	120	220	45.5	54.5	50¾	1.113	18.63	96.0	61.0
1885..	106	125	231	45.9	54.1	48 9-16	1.065	19.39	87.0	71.5
1886..	106	130	236	44.4	55.6	45⅝	0 995	20.78	94.6	124.9
1887..	106	136	242	43.8	56.2	44⅝	0.978	21.13	125.0	163.4
1888	110	146	256	43.0	57.0	42⅞	0.939	21.99	134.8	134.9
1889..	120	159	279	43.0	57.0	42 11-16	0.935	22.09	168.9	138.4

*The figures of production are the "most probable values" arrived at from a comparison of the tables of Soetbeer, the Director of the U. S. Mint, and Sir Hector Hay. The price of silver is taken from the report of the Director of the Mint for 1889. The price ratio is from Soetbeer's tables down to 1885, and from 1886 to 1889 is calculated from the London price. The last two columns of the table give the gold and silver coinage of the United States, England, Germany, Russia, France, Belgium, Italy, Austria, and India, which latter, however, coined only silver in each year from 1852 to 1885. The figures for the years 1852 to 1885, inclusive, are from the British report of 1887; subsequent years, including coinage of all countries, from report of Director of U. S. Mint for 1890.

being unaffected either by the decrease in the gold production or by the increase in silver production.

In 1872 the rapid decrease in gold production, which had taken place for four years previously, was arrested, and for the next four years the decrease was very slight, and in the ten years following a considerable increase took place. At this time, 1872, no change took place in the rate of increase of silver production, this rate being nearly the same from 1867 to 1877. Yet in 1873 began the decrease in price of silver, which has continued with but slight fluctuations to the present time. During the 23 years (1850 to 1872) the whole extent of the variation in price was only between $1.36 and $1.32 per oz., or 3·8c., while in the 17 years, 1872 to 1889 inclusive, it declined from $1.322 to $0.935, or 34·7c., or over 26%.

The diagram does not reveal the cause of the decline in the price of silver, for if it be assumed that the ratio of the production of silver to that of gold controls the price of the former, then the decrease in the price should have begun in 1860, when the ratio of silver product began to increase, and the decrease would have been more pronounced in 1867, when the silver product increased more rapidly, and the gold production decreased.

There is nothing in the figures or in the diagram to explain why the decline began in 1873 instead of in 1860 or 1867.

A study of Soetbeer's figures for 380 years, from 1493 to 1873, will also show no relation between the relative production and value of gold and silver, and from 1800 to 1870, although the value of the product of the two metals varied from 3·227 silver to 1 gold down to 0·44 silver to 1 gold, the relative price varied only between 15·41 and 15·83 to 1.

*From census report upon the Production of Gold and Silver in the United States in 1889.

From the year 1873 to the present time, however, there appears to be a very close agreement between the product ratio and the price ratio, as shown by the coincidence between the curves on a diagram representing "gold production, per cent. of total gold and silver," and price of silver in pence in London. Thus in 1873 the total value of the gold product expressed as a percentage of the total of the gold and silver was 59·9%, and in 1889 it was 43·3%; the price of silver in London in 1873 was 59¼ pence, and in 1889 42 11/16 pence.

Of the possible causes of the phenomenon of the steadiness in price of silver until 1873, and the steady decline since that time, many explanations are given in the report of the British Commission on the Recent Changes in the Relative Values of the Precious Metals. The cause which seems to have most weight in the opinion of all the members of the committee, is the cessation in 1873 of the free coinage of silver in Germany, Holland, and the Latin Union, comprising France, Belgium, Italy, Switzerland and Greece. In the conclusion of their report, agreed to by all the members of the commission, they say:

"We are of the opinion that the true explanation of the phenomena which we are directed to investigate is to be found in a combination of causes, and cannot be attributed to any one cause alone.

"The action of the Latin Union in 1873 broke the link between gold and silver, which had kept the price of the former, as measured by the latter, constant at above the legal ratio; and when this link was broken the silver marketwas open to the influence of all the factors which go to affect the price of a commodity.

"These factors happen since 1873 to have operated in the direction of a fall in the gold price of that metal."

THE RELATION OF THE PRICE OF SILVER TO THE PRICE OF COMMODITIES.

In the discussion of the relative product and the relative price of gold and silver it has been shown that prior to 1873 the price of silver was not controlled by the ratio of the product of the two metals, but that since 1873 the price of silver appears to be, if not controlled, at least strongly influenced by the ratio which the product of silver bears to the total product of both gold and silver.

Prior to 1873 the price of silver in gold or the ratio of gold to silver remained nearly constant for two hundred years, the two metals being maintained at a level by the coinage laws of the leading civilized nations; but since 1873, when free coinage of silver ceased, silver became a commodity, and its price thereafter fluctuated in the same manner as other commodities. The relation of the price of silver to the price of other commodities is clearly shown in a table presented by Mr. Augustus Sauerbeck to the British Commission on Recent Changes in the Relative Value of the Precious Metals (First report, page 317), giving the "Index Numbers" from 1846 to 1885 of the prices (in London) of forty-five commodities, including vegetable food, animal food, sugar, coffee and tea, minerals, textiles, and sundry materials, and of the prices of silver.

The diagram on the opposite page plotted from the table shows that the price of silver remained practically constant between 1846 and 1873, fluctuating only between 97·5% and 102% of the par ratio of 15½ to 1, while the price of commodities fluctuated violently, the index number for the total of forty-five commodities falling from 95 in 1847 to 74 in 1849, rising from 75 in 1851 to 102 in 1854 and to 105 in 1857, dropping to 94 in 1859 and rising to 105 in 1864, dropping slowly to 96 in 1870 and rising to 111 in 1873.

The index numbers of food and of materials other than food follow quite closely the figures representing the total of forty-five commodities, except during the years 1861 to 1867, including the period of the American war. During this period the index numbers of food were as low as 88 (in 1864), while at the same date the index number of materials other than food rose to 119. After 1867 the index numbers of food and of materials again showed a correspondence.

Since 1873 there has been a steady downward tendency of the prices of both food and material, the price index numbers of food, however, being higher than those of materials, the index numbers of the forty-five commodities falling nearly midway between those of food and of materials

The relative price of silver as compared with the par ratio of 15½ to 1 follows the index numbers of the forty-five commodities quite closely, showing that since 1873 silver has become a commodity and is subject to the same laws of fluctuation of price as other commodities.

The number of accidents in British collieries during the first half of 1891 was unusually small. The total number of persons killed by explosions of firedamp was only 18, against 276 in the corresponding period of 1890 and 56 in the same time in 1889.

An Oxide of Gold.—Using a fine sheet of gold as positive electrode in a sulphuric acid or nitric acid solution, W. Hampe found (*Chem. Zeit.* 14, 1778) that the same became colored brown, and finally a reddish-brown powder fell to the bottom of the electrolyzing dish. This was proved qualitatively to be a hydrate of gold formed by the oxidizing action of the electrolytically evolved oxygen. On drying over sulphuric acid, and then heating, it exploded violently.

Chloride of Calcium for Gasholders.—The well-known property of strong solutions of chloride of calcium to remain liquid at ordinary winter temperatures has been utilized in Brussels, says *Industries*. A solution of 30° Baumé has been used in place of water, or mixtures of water and glycerine, in the gasholders of that city, with very satisfactory results. The solution has the further advantage of remaining constant in amount, as the hygroscopic nature of this salt prevents loss of water by evaporation. In cost it compares favorably with glycerine, which has also been suggested for the same purpose. The solution can also be used in traps and siphons which are so situated as to be affected by the annual variations of temperature, and as the solution is neutral no action has been noticed on the metal of which the holders or pipes are constructed. The constant volume of the solution renders it specially applicable in those works in which a double holder is employed for measuring separately the consumption of gas during the day and night. A solution of 16% of the salt of 18° Baumé is liquid at —15° C., so that this strength is sufficient in most climates. A slight deposition of carbonate of lime is noticeable at times, due to the action of small quantities of carbonate of ammonia in the gas, but the amount is so small that no inconvenience is caused by its formation.

DESCRIPTION OF ORE HANDLING AT THE BUNKER HILL AND SULLIVAN MINES, WARDNER, IDAHO.

Written for the Engineering and Mining Journal by V. M. Clement, M. E.

The Bunker Hill and Sullivan mines, situated near the town of Wardner, Shoshone County, Idaho, are on the western slope of the Bitter Root Mountains and on the west side of the South Fork of the Cœur d'Alene River, about 40 miles from its inlet into the lake of the same name. The mountains are of sedimentary origin, principally of quartzites, schists, and slates. The mines are situated at an altitude of 3,200 to 4,200 ft. above the sea, occurring in quartzite and argillaceous schists. The valuable mineral is argentiferous galena, with iron carbonate and sulphuret as matrix; and is unusually free from zinc and other deleterious metals.

The deposit is of "true fissure" character, non-conformable to the bedding of the formation, and of remarkable persistence and continuity. The mineral is found disseminated throughout the vein matter and seldom in concentrated bodies. The ore is reduced to a marketable form through concentration by the jig process, and the product transported by two lines of railroads to the principal smelters of the United States.

In its marketable form the ore or concentrates contain from 60% to 65% of lead and 25 to 30 ozs. of silver per ton, with iron as the impurity. It requires from 6 to 8 tons of crude ore to produce 1 ton of concentrates. The quantity of ore of this character opened in the mine is very large, especially of the lower grade.

For a period of about two years the property was operated by a 120-ton steam plant situated at the mines, with a capacity, from selected ores, of 30 tons concentrates per day. Subsequently the mines were closed down by litigation. It was decided, upon resuming operations, to introduce a more economical system of handling the ores, and obviate to a certain degree all hand sorting. During the past spring a new concentrator of 400 tons daily capacity, operated by water power, was erected on the river, about 1¼ miles from the mines. The plan, construction, and operating of this concentrator, which possesses some novel features, will be the subject of an article at a future date.

The water-power consists of the waters of the South Fork River conveyed by a flume 8 ft. wide and 5 ft. deep, a distance of 3 miles, delivering 12,000 cu. ft., with an available fall of 60 ft., equivalent to 1,000 H.P. The surplus power will be conveyed to the mines shortly.

The mines are opened exclusively by tunnels and open cuts with "backs" of 600 to 800 ft. vertically. The ores from the various workings are collected into a bin 40 ft. high, 20 ft. wide, and 75 ft. long, having a capacity of 4,000 tons. The bin arrangement is such that the ore dumped over grizzlies is fed by gravity to the crushers, one man feeding with ease 400 tons per 10 hours. The delivery to this bin is made in a manner to meet the different situations of the workings, as follows: 1st. From a large open cut or quarry on the mountain side by a Bleichert tramway. This tramway is 1,200 ft. long, with a fall of 460 ft., and has but two intermediate supports or towers. Its capacity is 25 tons per hour in loads of 400 lbs.; it employs 5 men as working force. 2d. From several tunnels on the mountain side by a 3-rail incline gravity tramway, with 2 cars of 3 tons on each rope, running at a speed of 600 ft. per minute. This is operated one man at each end. 3d. From the adit tunnel or lowest workings, by trains of 15 to 20 tons capacity. No hoisting is done on any portion of the property.

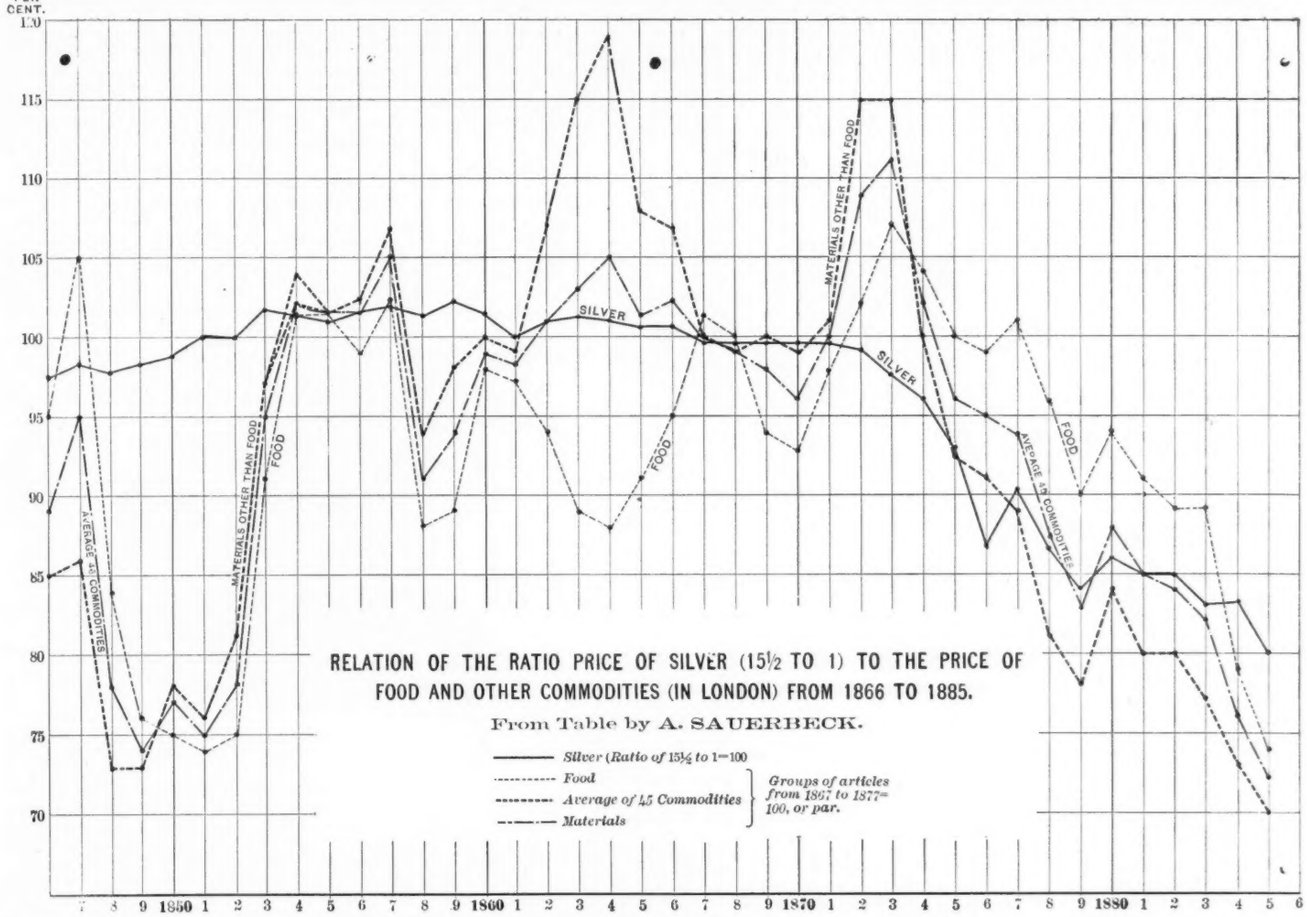
From the large bin, after the ore has been crushed, delivery is made to the mill, 1¼ miles distant, by a Bleichert tramway. This tramway, which was planned and erected by Trenton Iron Co., of New Jersey, may be considered as consisting of two consecutive parts, connected and operated by a common brake arrangement at the point of connection. The interruption in the line is made in a gulch, at the point of lowest depression and beginning of the rise to the highest summit. At this point is situated the town of Wardner, and, in order to clear the buildings, a structure 40 ft. high by 90 ft. long was erected, wherein the brake machinery is operated. The line thus gives a clearance from 40 ft. to 90 ft. in height. This structure is covered with corrugated iron and besides is protected by a sheet-iron fender from danger of fire from adjoining buildings.

The entire line is 9,100 ft. long between the terminals, with a fall of 700 ft., and is entirely self-operating. There are intermediate supports varying from 75 ft. to 450 ft. apart and from 12 ft. to 90 ft. in height. These are built of selected lumber in towers of four posts, 8 in. and 10 in. square, braced, mortised, and bolted together. At two mountain ridges or points of greatest strain and curvature the ropes have been protected by stationary rails, over which the buckets travel. At these two points cuts into the embankment were made to reduce the curvature and otherwise ease the line. The two terminals offer no new features over the ordinary form, excepting the lower one, which is anchored to the ore bin itself. This ore bin is of rectangular section, 100 ft. long, 20 ft. deep, and 32 ft. wide, with a line of spouts on one side discharging into an endless iron trough conveyor feeding to the rolls in the mill.

The tramway terminal at this point has a rail arrangement with switches, so that buckets are discharged at any desirable part of the bin. These switches are connected also to rails which lead to the flume and timber-framing machine, situated on an extension of the same floor. Thus fuel and mine timbers floated from the woods into the flume are loaded directly on the tramway and conveyed to the mines. There is also a connection with the railway tracks, which are at the lower end of the mill, by an incline hoist.

In the original design for this tramway arrangements were made to transmit 30 H. P., to be supplied at the lower terminal, and to be utilized at the upper end to operate crushers, etc. This plan was subsequently changed; power, when needed, is now added at the brake station by gearing from a water wheel.

This line was constructed for 400 tons capacity per 10 hours, with 50 tons of return freight. The buckets contain 5 cu. ft., equivalent to 750 lbs. capacity; they are distributed 135 ft. apart, and travel at a mean rate of 33 seconds per bucket. The operating force of the entire line when in working order is nine men (inclusive of the lineman). The cost of operating the line is not yet determined, as the consumption of lubricants, repairs, wear and tear can be ascertained and averaged only by a long period of operations. It is estimated, however, that 12c. per ton of ore handled will cover all expenses.



STONE COAL IN THE LEAD BLAST-FURNACE.*

By James W. Neill, E. M., Leadville, Colo.

Bituminous coal has for many years been used for the smelting of iron ores in the blast furnace. In some districts in Scotland it is used alone, in others it is used mixed with coke. The similar use of certain bituminous coals in the United States has been repeatedly mentioned. In the lead-silver smelting blast furnace, however, the requirements of iron smelting are not present. Here the general question is, which fuel, or fuel mixture, will permit the most rapid driving of the furnace? The conditions of efficiency in the reduction of iron, of sufficient heat, of capacity to carry the burden, etc., are usually satisfied by any of the commercial cokes of the regions surrounding the lead-silver smelting districts, and it is therefore usually the price which decides the choice of coke. In most of these smelting districts, bituminous coal of non-coking character is very much cheaper than the coke, and its use alone or with coke would materially lessen the fuel expense per ton of ore. This saving, if achieved without occasioning other losses in the working of the furnaces, would be net gain to the silver-lead smelter, and the following experience with the use of bituminous fuel is given to show what can be done in this way.

About 1884, while in charge of the smelting works at Mine La Motte, Mo., I ran short of coke, and having a supply of stone coal on hand, I replaced half of the coke in the charge with this coal, continuing its use until a supply of coke arrived. During this period (about 24 hours) no noticeable change in the working of the furnace occurred; but as the stone coal was more expensive than the coke, the practice was not continued. With the precedent of various authorities,† and my own brief personal experience, and in view of the circumstance that in Leadville to-day coke costs three times as much as certain kinds of coal, I have recently ventured to experiment with Rocky Mountain coal in the blast furnaces of the Harrison Reduction Works.

These furnaces are 78 × 36 ins. in size at the tuyère line, have 10 ins. bosh in the jackets, and are about 12 ft. high from tuyère to charge door. At the time the experiments commenced, the furnaces, having been running some time, were in bad condition from zinc accretions in the upper part of the stacks, and would have to be "blown down" and "barred out" in a few days at farthest; and I reflected that, if the coal should prove impracticable as fuel, this event would only be slightly hastened.

On January 20th, 1891, I replaced on No. 1 furnace 50 lbs. of Cardiff coke with 60 lbs. of lump coal of a non-coking variety. The fuel charge before the change had been: Coke, 185 lbs.; charcoal, 65 lbs. It was now: Coke, 135 lbs.; stone coal, 60 lbs., and charcoal, 65 lbs. The charge was made on the evening of the 20th. Next morning showed no appreciable change; slag assays were good, but in the afternoon the slag commenced to thicken and get colder, and finally refused to run out of the tap hole, filled all the tuyères, and compelled a stoppage of the furnace. On taking out the tap-jacket, I found that the charge had slipped down, filling the basin with raw material, which had stopped the slag. We heaved out a quantity of this raw material and cleaned the tuyères, and put on the blast again, when the furnace cleared itself without further serious trouble. Much to our surprise, we found the top of the furnace in better condition, the amount of accretions hanging on the sides being much less and the charges settling more evenly.

On the 22d, as No. 1 continued to do well on this fuel, I put the same fuel charge upon furnace No. 4, the upper part of which was also in bad condition. Here the result was the same; but by careful watching serious trouble was avoided. Meanwhile, instead of our having to clean No. 1 in a day or two, it ran thirteen days after the coal was first put on.

During the first week in February, all the furnaces were blown down and barred out, and blown in again on the above fuel charge, all starting off nicely. On the 4th of February the charge was changed to: coke, 120 lbs.; stone coal, 70 lbs.; charcoal, 70 lbs.; and on this charge they ran until the 14th. During this period the coal used was a lump coal from Rouse, Colo., a semi coking coal of good quality, a sample giving us 8·91% of ash. The pecuniary saving was that, in fourteen days, we replaced 126 98 tons of coke at $8, costing $1,015.84, with 148 15 tons lump coal at $5.50, costing $814.82, a difference of $201.02.

On February 14th I replaced the lump coal with an equal weight of pea coal from the Sunshine mines. A sample of this gave us 7·72% of ash; it is a semi-coking coal, and costs us $2.50 per ton. The furnaces ran for the remaining fourteen days on the same charge of fuel as during the first half of the month, doing their work nicely. During this time we replaced 126 84 tons of coke at $8, or $1,014.72, with 147·98 tons of pea coal at $2.50, or $369.95, thus saving $644.77. The total saving for the month of February was, therefore, $845.79, which amounts to about 26 cents per ton of material smelted.

During March we used about the same fuel charge, the coal being part nut, part pea, and part lump, each used separately; and the total saving by the use of these fuels in place of coke was, for March, $1,075.08, or about 30 cents per ton of material. For a few days I increased the amount of stone coal to 100 lbs., using with it 100 lbs. of coke and 70 lbs. of charcoal; but the furnace did not work well on this charge, the hearth becoming clogged and slag flooding the tuyères. Whether this was due to the fuel or to bad charging remains to be proved by further tests.

Aside from the direct saving by the use of the stone coal, we have observed the following advantages in the working of the furnaces:

Below.—The slags appear better reduced and hotter, and the matte separates very well. Slag assays have been, if anything, lower than on the old fuel; and this is particularly the case when the charges are hanging above. The jackets keep hotter and the tuyères brighter; thus the fuel is more completely consumed; the furnace "rods" more easily; the crucible keeps open better; the lead is hotter.

Above.—The volume of smoke is somewhat increased and smells decidedly "tarry," but does not look different from that of the old fuel; the charges settle much more evenly and the fire does not creep to the top; thus the furnaces seldom flame. As the tops keep much cooler, the production of flue dust is much smaller, and the losses of metals by volatilization must also be diminished. The furnaces now run about a week longer than formerly before needing to be barred out; and this operation is no more difficult than before; but on blowing them down, the charge now sinks much further before flaming commences.

The pressure of the blast has not changed materially from that of the old-fuel charge, but now remains more uniform. The necessary reduction of iron can thus always be relied on.

To the practical furnace man, these advantages are of almost as much importance as the direct saving in the cost of smelting.

The short trial with a higher percentage of coal I do not consider conclusive, and I am now working the amount of coal up by gradual steps to see what proportion we can use to the best advantage. The limit will probably be reached sooner on our low furnaces than it would be on higher ones. We are now using 27% of coal on the fuel-charge, and I believe that on our furnaces the limit will be reached at about 33⅓, but that on higher stacks the percentage could be carried to at least 50.

Of course, this will in a measure depend on the quality of the coal used. For instance, I was obliged recently to use coke and coal from Southern Colorado (containing 20% and 13% of ash respectively) in place of our regular fuel (containing 11% and 8% respectively), and although I made allowance for the difference in fuel value and added flux for the ash, we had much trouble with the furnaces, owing to scaffolding of charges and incomplete combustion before the tuyères, with consequent bad effects on the slags, etc.

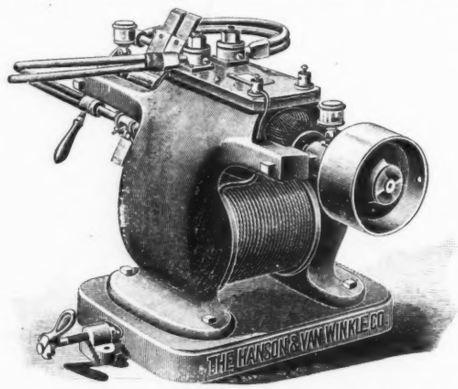
There are many smelting districts where the difference between the prices of coke and coal is even greater than in Leadville. In such places the direct gain by the use of coal instead of coke will be correspondingly greater. But to practical furnace men the other advantages above described will be, perhaps, sufficient to induce a trial of this simple experiment, even where the item of saving in fuel cost is not important.

* Presented at the Cleveland meeting of American Institute of Mining Engineers, June, 1891.

† T. Sterry Hunt, Trans. A. J. M. E., ii, 275, vii, 313; J. S. Alexander, i, 225; A. Ellser, i. 216; Phillip, *Elements of Metallurgy*, p. 250; Groves & Thorpe, Chemical Technology, vol. 1.

THE HANSON & VAN WINKLE ELECTRO-PLATING DYNAMO.

The accompanying engraving illustrates a new electro-plating dynamo, recently put upon the market by the Hanson & Van Winkle Company, of 219 Market street, Newark, N. J. The machine is very compact, and it is claimed that it has 30% greater efficiency than any other machine sold at the same price. The field magnets have round cores of wrought iron and very short magnetic circuits. The armature is of the Siemens' type. The commutator is easily taken off to renew the segments, which



are made of tempered copper, and are very durable. The lubricating arrangements of the bearings are such as to require attention but once a week.

The new dynamo is made in five sizes. The voltage of the machine used for nickel plating, etc., is about 5½. The manufacturers of this dynamo are just getting out a special rheostat of new construction, which will make it possible to regulate the voltage perfectly, so that any current can be produced by the machine.

The Circuit Court of St. Louis has rendered a decision that express companies receiving goods from owners are liable for them until they arrive at their destination, no matter how many companies handle them in transit.

Communication Between the Earth and Mars.—A long time ago the distinguished French astronomer, Flammarion, expressed the belief that communication would be established one day between the earth and the planet Mars. The idea seems to have appealed very strongly to the fancy of an old lady at Pau, France, who died recently, bequeathing a legacy of 100,000 francs as a reward to the first scientist who may devise a scheme for successfully accomplishing the feat. The money, which is payable for ten years only, is to be held in trust by the French Institute.

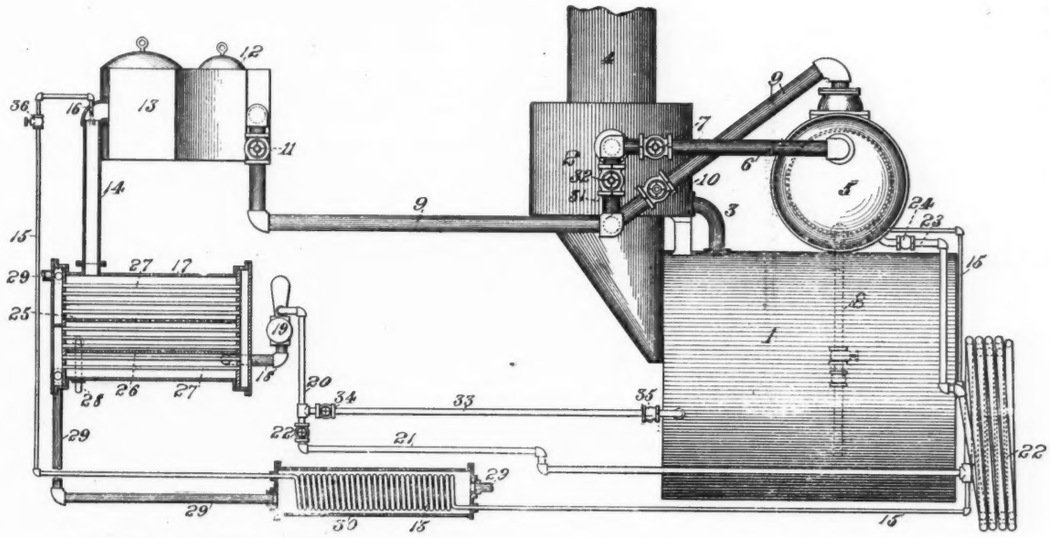
Forfeiture of Mining Lease.—The owner of a mine leased it to certain parties and his son to mine, upon condition that they pay a seventh of all ores raised by them as rent. He was also a party to this agreement as one of the mining company which had the privilege of working the lot for mining purposes. The company was required to regularly prosecute its mining, and if it failed to work for three weeks forfeited the rights acquired under the contract. After some months work was stopped for 13 or 14 months on account of water in the shaft. The landlord might consent to that delay in working and waive the forfeiture, as under these circumstances it was held he did. But if he did not intend to waive it, being one of the mining company itself, good faith and fair dealing would require him to distinctly notify his partners that he would insist upon the forfeiture if they failed to work according to the lease.—*Wesling v. Kroll, Supreme Court of Wisconsin*, 47 *N. W. Rep.*, 943.

THE CAMPBELL AMMONIA ENGINE.

The Campbell Engine Company, of 35 Wall street, New York, is engaged in exploiting the ammonia engine recently invented by Messrs. J. H. and C. H. Campbell. A tugboat, the "Edwin D. Hartley," 85 ft. long, 18 ft. beam and 8½ ft. draft, having compound engines, has been equipped with the apparatus, and has during the past fortnight made a number of successful exhibition runs in New York Harbor, which have been attended by many well-known engineers, and in the meanwhile is regularly engaged in towing work. The boat was fitted with the Campbell apparatus in Philadelphia, and in the run from that port to New York did excellent work.

The principle upon which the economy of the ammonia engine chiefly depends is the fact that with a given pressure of steam ammonia gas of higher pressure can be generated, the latter being used in the steam cylinders instead of the steam. In the accompanying cuts the parts of the apparatus are represented as follows: (1) steam boiler, (5) ammonia generator, (12) and (13) high and low pressure cylinders, (29) the regular condenser, (30) cooling coil, (22) equalizing coil. In Fig. 1 is shown a longitudinal section of the ammonia generator (5), and in Fig. 3 an end section of the regular condenser (29). The working of the apparatus is as follows: Steam is raised in the regular boiler, as usual. The ammonia generator (5), Fig. 1, which is constructed on the same principle as an ordinary tube boiler, is half filled with aqua ammonia. Steam is turned on through the pipe (6), Fig. 2. It runs through the tubes and out at pipe (8) and back into the boiler, having done all that is required of it, namely, heated the ammonia. It is then used over again without waste. The

Fig. 1.



CAMPBELL AMMONIA ENGINE.

ammonia gas raised to high pressure in the generator (5) is carried by pipe (9) to the high-pressure cylinder (12); thence to low-pressure cylinder (13); and is then exhausted through (14).

The condensation of the ammonia gas is effected in the following manner: from the generator (5) is carried through pipe (15) a small stream of the liquid from which the gas has been previously expelled; on its way it is cooled first by meeting the ammonia returning from condenser in a coil (22), the pipe (15), which is the smaller, running inside of pipe (23) in the coil (22). Pipe (15) again runs through a cold-water coil (30) and the liquid finally meets the exhaust in the pipe (16) in a full spray, immediately absorbing the gas, which goes into the condenser as a liquid again.

The process of condensation is similar to the ordinary steam method, with the exception of having a water trap (27) through which all return exhaust must pass, thereby assuring the complete condensing of any gas still existant. The pump (19) then drives the ammonia back to generator (5) in the same state as when first put there, and it is used over and over again.

Among the advantages claimed by the Campbell Engine Company for the use of ammonia instead of steam, it is said that a saving in fuel of 50% can be effected; it acts as a perfect cylinder lubricant, no oil being used: the steam boilers employed with the ammonia process do not require cleaning nor the use of a boiler compound, and it is claimed that they will do service fully five times as long as when steam is the motive power.

The Campbell system may be adapted to an ordinary engine, the special mechanism being very simple of application, and connected between the ordinary steam boiler and the engine. The only change necessary in applying the Campbell method to an ordinary engine is the removal of the brass and copper fittings in any valves or pipes that come in contact with the ammonia gas, and substituting iron and steel. If an engine were built with a view to using ammonia a considerable saving in cost might thus be made by using iron or steel everywhere in place of the more expensive metals, brass and copper. The idea that ammonia cannot be kept in a container without more or less odor escaping has been proven by Mr. Campbell to be a mistaken one. He claims he can run for weeks, and that no odor will be detected. The system is applicable to either marine or stationary engines, with very slight cost in the latter, they being the less complicated. In the marine engine the system does away with the air pump and hot well, the regular steam condenser being used.

PRODUCTION OF IRON AND STEEL IN THE UNITED STATES DURING THE FIRST HALF OF 1891.

According to the *Bulletin* of the American Iron and Steel Association published on the 21st inst., the total production of pig iron in the United States in the first half of 1891 was 3,371,925 gross tons, against 4,560,513 gross tons in the first half of 1890, a decrease of 1,188,588 gross tons, or 26%.

The decrease in production was very unevenly distributed among the various States. Several actually increased their production in the first half of 1891, as compared with the first half of 1890. These were Massachusetts, Connecticut, Georgia, Texas, Michigan, and Colorado. Four of these States produce only charcoal pig iron. The production of Pennsylvania was reduced 636,204 net tons; Ohio, 237,568 tons; Illinois, 149,819 tons; Alabama, 84,330 tons; Missouri, 46,634 tons; New York, 44,611 tons; West Virginia, 42,662 tons; Wisconsin, 31,486 tons; Virginia, 25,144 tons; Maryland, 22,640 tons; New Jersey, 20,504 tons; Kentucky, 6,767 tons; Indiana, 3,988 tons; Oregon, 652 tons; and North Carolina, 398 tons. Tennessee came very near maintaining her record for the first half of last year, producing in the first half of 1891 within 1,483 net tons of her production in the first half of 1890.

The reduction in anthracite and mixed anthracite and coke pig iron in the first half of 1891 was 17·2%, in unmixed coke and raw bituminous pig iron 30·8%, and in charcoal pig iron 6%. The reduction in Bessemer pig iron was 32·8%.

The production of pig iron in the nine Southern States in the first half of 1891, as compared with the first half of 1890, shows a falling off amounting to 17·5%.

The production of Bessemer-steel ingots and Bessemer-steel rails in the United States in the first half of 1891 also shows a great falling off as compared with either half of 1890. The shrinkage in the production of Bessemer-steel ingots in the first half of 1891, as compared with the first half of 1890, was over 21%, while the shrinkage in the production of Bessemer-steel rails in the same period was nearly 44%.

Fig. 2.

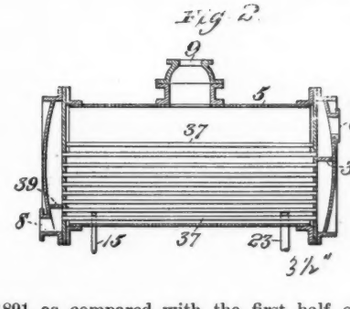
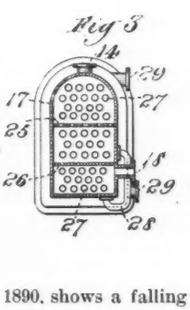


Fig. 3.



Widening the Suez Canal.—The Suez Canal is being widened in some parts to the extent of 50 ft. The widening had been completed at the close of 1889 for a distance of about 10 miles from Port Said. In the course of last year the widening was completed for a further distance of five miles. By the close of 1891 the widening works are expected to reach a point 22½ miles from Port Said.

According to the *Iron and Coal Trades Review*, a largely increased trade is now being developed in the waste slag of the basic steel works in Staffordshire, England. The demand for this product from German importers is extending rapidly, and they are buying up all available supplies. In England also the demand is increasing for fertilizing purposes. Slag, which was formerly sold at 2s. 6d. per ton is now realizing 25s. per ton.

THE REFINING OF PETROLEUM AND LUBRICATING OILS.*

Petroleum and lubricating oils obtained by the distillation of mineral oil are generally refined by treatment with sulphuric acid and caustic soda, followed by washing with water. Sulphuric acid at 66° B. is mostly employed, the amount used ranging from 2% to 4% for petroleum to 5% to 10% for lubricating oils. The acid is well agitated with the oil, either all at once or preferably in several installments, the acid being allowed to settle thoroughly after each treatment. The acid combines with and dissolves the olefines and aromatic hydrocarbons contained in the oil, and an oxidizing action also appears to take place, indicated by the evolution of sulphurous acid. This latter action increases with the specific gravity and temperature of the oil, so that it is well to keep the mixture cool. The time of treatment varies from one to two hours, the operation being finished when a sample of the oil shaken with caustic-soda solution appears milky and white or only slightly yellow (petroleum), or when the original green-brown color has changed to violet-red (lubricating oil). The loss during acidification is 1% to 3% for petroleum and 8% to 15% (seldom 20%) for lubricating oil.

The oil is next washed with water and well agitated with a caustic soda solution at 30°–33° B. The intermediate washing is best omitted in the case of lubricating oils, since it leads very often to the formation of emulsions, which are separated from the oil with great difficulty. The treatment with soda is continued for 5 to 10 minutes at the ordinary temperature in the case of petroleum; while with lubricating oil the action is carried on at 40°–60° C. until the violet color of the oil is changed to a wine-yellow tint. The consumption of soda lye at 33° B. is about 1% to 1·5%. Too long a treatment with soda must be carefully avoided in order to prevent the extensive oxidation of the oil and the consequent production of the sodium salts of organic acids.

The salts are partially saponified during washing, the acid liberated being dissolved by the oil and leading to turbidity in the finished product. The oil, after being separated as completely as possible from the lye, is washed with cold water (for petroleum), or with water at 60°–70° C. (for lubricating oil) until perfectly neutral. Thorough washing is of the greatest importance. Petroleum containing sodium salts in solution burns badly owing to the incrustation that soon forms on the wick; besides which sulphurous acid is given off if sulphates, etc., be present. The water should be as free from dissolved salts as possible, especially for washing lubricating oils.

After washing, petroleum is left in reservoirs for 12 to 36 hours, so that the last traces of water may settle. Or, after standing for an hour it may be filtered through a mixture of wood-shavings and salt. In either case the oil will be ready for the market. Lubricating oil is kept in a vessel heated by steam until the bulk of the water has settled. It is then transferred to a shallow double-bottomed pan and "boiled" by steam until it is quite bright and clear, and no longer froths. In many cases the oil is, after boiling, filtered through animal charcoal, etc.

The apparatus in which the oils are chemically treated may be divided into two groups: 1. Those in which some mechanical stirring apparatus is employed. 2. Those in which agitation is effected by strong current of air entering the bottom of the apparatus. The author is strongly of opinion that those of the first class are much to be preferred. Agitation by means of air currents is certainly more thorough than by any mechanical device; but when the ready oxidability of petroleum, and more particularly of lubricating oil, and the injurious influence of the acids so produced are considered, it will be seen that mechanical stirring arrrangements are really the more advantageous. In the case of air agitators there is also a much greater tendency toward emulsification, which is very objectionable. The turbidity appearing in finished petroleum, etc., is chiefly due to the presence of organic acids and salts, which gradually separate. The turbidity which badly refined oil sometimes develops in barrels is most likely caused by the action of organic acids on traces of chalk contained in the glue with which the interiors of the barrels are coated.

* *Chemiker Zeitung*, 15, pp. 352-354.

ANSWER TO THE INTERSTATE COMMERCE COMMISSION'S PETITION IN THE COXE BROS. & CO.'S SUIT BY THE LEHIGH VALLEY RAILROAD COMPANY.

The Lehigh Valley Railroad Company has filed in the United States District Court, at Philadelphia, Pa., its answer to the Interstate Commerce Commission's petition relative to the suit of Coxe Bros. & Co. It admits the following points in said petition: That it is a corporation operating under the laws of Pennsylvania; that it is a common carrier in Pennsylvania, and in New Jersey, as lessee of the Easton & Amboy Railroad; that it at the time was and still is subject, so far as the same is legal, to the provisions of the act entitled "An Act to Regulate Commerce' and amendments thereto; that it was on October 19th impleaded, upon the petition of Eckley B. Coxe *et als.*, for alleged violation of said act; that the cause was heard by the Interstate Commerce Commission, and that a finding was made (see ENGINEERING AND MINING JOURNAL, March 21st, 1891), and that an official copy of the same was served upon it March 13th, 1891; that it has not complied with the order so made by said Commission, and that it has not at any time since the making of said order (in compliance therewith) carried anthracite coal from Drifton, Eckley, Gowen, Tomhicken, Derringer or Stockton, in the County of Luzerne, State of Pennsylvania, nor from Beaver Meadow, in the County of Carbon, State of Pennsylvania, to Perth Amboy, in the State of New Jersey, at a rate or charge per ton of 2,240 pounds of $1.50 per ton upon prepared sizes, or of $1.25 per said ton on pea coal, or of $1.05 per said ton on buckwheat coal, or of $1.05 per said ton on culm; and that since the making of said order, and also since the service of said notice, this defendant has charged, collected and received from the said Coxe Bros. & Co., and from other shippers and consignees, freight rates in excess of said rates last specified.

The defendant, the Lehigh Valley Railroad Company, avers as follows: That at the hearing of the issue it did not appear that it had violated any provisions of the act above referred to. It denies the truth of the averments in the petition referred to preceding, viz.: That it has in divers particulars violated the provisions of said act. That the findings of fact, and the conclusions emanating from said Commission based upon said findings, were not just or in accordance with fact or law. That the conclusion that the rates charged by it for the transportation of anthracite coal from the coal regions to Perth Amboy were unreasonable and unjust, was erroneous.

It avers that the rates by it then charged, and since continued by it to be charged, for said transportation were just and reasonable. That said conclusions of the Commission were unreasonable and unjust and not in accordance with the evidence or law. That the reasoning upon which said conclusions were reached was fallacious and unsound. That by its charter it is expressly authorized to charge for its transportation of anthracite coal in the State of Pennsylvania, from any point on its line in said State to any other point in said State, the sum of 1½ cents per ton per mile for tolls, and 1½ cents per ton per mile for transportation. It further avers that the Easton & Amboy Railroad Company, of whose railroad in the State of New Jersey it is the lessee, is authorized by its charter to carry coal from any point in said State on its line to any other point thereon in said State, at a much larger sum per ton per mile than is allowed to be charged for transportation in Pennsylvania. That the whole transportation of anthracite coal by it from the coal regions of Pennsylvania to Perth Amboy, in the State of New Jersey, is done by it over its own line in Pennsylvania and over the line of said lessor company in the State of New Jersey, and that it is authorized by its own charter and by the charter of said corporation lessor to charge for said transportation the rates above stated per ton per mile, which are greatly in excess of the rate per ton charged by it, which were found by the Commission to be unreasonable and unjust. That the act entitled "An Act to Regulate Commerce" does not authorize the Commission, under such circumstances as were presented by the petition and answer filed with it, and by the evidence taken thereunder, to determine or find that rates such as were charged by the defendant were unreasonable and unjust. That said act does not authorize the said Commission to fix the rates of transportation which shall be charged by railroad corporations nor to make the order issued (see ENGINEERING AND MINING JOURNAL, March 21st, 1891). That the said act does not authorize the Commission to condemn as unreasonable and unjust, nor to regulate or fix the rates of transportation or any general rates charged by common carriers, so long as said rates are uniform and do not improperly discriminate as between shippers, and are not greater than the rate allowed to be charged by the charter of said carrier.

It avers that if said act does permit the said Commission to make order such as the one set forth in the petition filed in this cause, said act is unconstitutional, because it illegally interferes with the common-law rights of common carriers; because it violates their chartered rights; because the power given to Congress by the Constitution of the United States to regulate commerce among the several States does not include the right to fix and establish rates to be charged by common carriers chartered by the several states; because the power last aforesaid cannot be delegated by Congress to the discretionary exercise thereof by a commission appointed by executive authority. That no rate of transportation charged by it, the defendant, which is less than that permitted by its charter, is, or can be held to be, unreasonable or unjust. That the rate so charged by it was legal, and was not unreasonable or unjust, because it was less than was permitted to be charged by the charter under which it operated.

The defendant prays that the petition in this case filed may be dismissed for lack of just foundation for relief in fact and in law.

Mount Baker Smoldering.—It is reported that smoke is rising from the crater of Mount Baker, one of the peaks of the Cascade range, situated in Washington, near the Canadian border. This peak, like many others on the Pacific Coast is a volcano, as is well known, but all of those in the United States have been quiet for so long that they have been supposed to be extinct. Within the last few weeks eight men have made the perilous ascent to the summit, and all have brought back word that a thin column of smoke is issuing from the crater. No eruption is expected, however; in the crater of Mount Rainier, the highest peak of the range, hot springs are still boiling, and within the memory of men now living smoke has come from the mountain.

Steel Girders for Mining Purposes.—The use of steel girders in place of timber for supporting the roofs of colliery workings appears to be growing in favor, says the *Iron and Coal Trades Review*. In Staffordshire, where the change has been found very profitable, steel girders are being manufactured and employed extensively for this purpose. At one large colliery alone in the Cannock Chase 12,000 of these girders have already been fixed, and they are being adopted also in Derbyshire and South Yorkshire. Of course the steel supports are themselves more costly than timber. They are, however, put into position with much less labor and are vastly more durable. In the Staffordshire mines the timber supports will not last more than six months without rotting, but it is calculated that the steel girders will remain good for from three to five years. In cases of settling down of the roof, when the timber support breaks and becomes useless, the steel girders are taken out and reversed, being merely bent. Some of them have been experimentally used for two years. Similarly steel pit props instead of wooden ones are being employed.

PATENTS GRANTED BY THE UNITED STATES PATENT OFFICE

The following is a list of the patents relating to mining, metallurgy, and kindred subjects issued by the United States Patent Office:

TUESDAY, JULY 21ST, 1891.

456,131. Direct-Acting Pumping Engine. Charles H. Atkins, Palmer, Mass.
456,149. Steam Boiler. Frank F. Landis, Waynesborough, Pa.
456,172. Method of Measuring Electric Currents. Elihu Thomson, Lynn, Mass., assignor to the Thomson-Houston Electric Company, of Connecticut.
456,231. Milling Machinery. Henry J. Woolcott, Staten Island, N. Y., assignor of one-half to Benjamin B. Stewart, same place.
456,294. Manufacture of Soda-Alum. Francis M. Spence and David D. Spence, Manchester, England.
456,299. Shaft Bearing. Eduard A. Bredenberg, Sundsvall, Sweden.
456,304. Stone Crusher and Pulverizer. Ryerson D. Gates, Chicago, Ill.
456,311. Flux for Smelting and Reducing Ores. Thomas Miller, Salt Lake City, Utah.
456,323. Ore-Leaching Machine. Pierre L. Gibbs, Clinton, Iowa.
456,343. 456,344. Railway Cross-tie Albert E. Roberts, Norwalk, Ohio.
456,363. Friction Clutch and Swivel Support. Elias R. Lockwood, Beatrice, Neb.
456,507. Magnetic Separator. Henry G. Fiske, New York, N. Y., assignor to John D. Cheever, same place.

PERSONALS.

Mr. C. M. Dobson, mining engineer, of New York, has returned from San Salvador, where he has been engaged for several months upon professional work.

Mr. L. L Munn, general manager of the San Miguel Consolidated Mining Company, has returned to Telluride, Colo., after a three weeks' visit in the East upon business of the company.

D. C. Jackson, electrical engineer in charge of the central district of the Edison General Electric Company, covering thirteen states, with headquarters at Chicago, has accepted the Chair of Electrical Engineering in the University of Wisconsin.

The ninth geological expedition sent out by Princeton College started for Montana last week. Last year, explorations were made in the White River district of Nebraska; this year the field of operations will be the Deep Creek or Smith's River region in central Montana. The party consists of Professor William B. Scott, of the department of geology of the college, who will command the expedition; Professor William F. Magie, professor of physics; Arthur W. Butler, of Yonkers, N. Y.; Imlay Bener, of Brooklyn; Edwin A. S. Lewis, of Hoboken, N. J.; Richard Coulter, Jr., of Greensburg, Pa.; James S. Hosford, of Kinderhook, N. Y.; Cyrus Church Jefferson, of St. Paul, Minn., and Robert A. Stevenson, of Lewistown, Pa.

The Leland Stanford, Junior University of California, has announced the names of the members of its faculty. The professorships in engineering and scientific studies are held as follows: John Casper Branner, formerly of the University of Indiana, professor of geology (work to begin in 1892); Oliver Peebles Jenkins, formerly of De Pauw University, professor of physiology and histology; John Henry Comstock, formerly of Cornell University, non-resident professor of entomology (resident in January, February and March); John Mason Stillman, formerly of the University of California, professor of industrial and inorganic chemistry (work to begin in 1892); Ferdinand Sanford, formerly of Lake Forest University, professor of physics; Charles David Marx, formerly of the University of Wisconsin, professor of civil engineering; Joseph Swain, formerly of Indiana University, professor of mathematics; Horace Bigelow Gale, formerly of Washington University, St. Louis, professor of mechanical engineering; Charles Henry Gilbert, formerly of Indiana University, professor of vertebrate zoology; Douglas Houghton Campbell, formerly of Indiana University, professor of cryptogamic botany; George Mann Richardson, formerly of Lehigh University, assistant professor of inorganic chemistry; Louis Alexander Buchanan, formerly of the St Louis Polytechnic Evening School, foreman of the wood-working shop, and Daniel Kirkwood, formerly of Indiana University, non-resident lecturer on astronomy resident in May).

OBITUARY.

Richard Francis, one of the engineers of the El Oro Mining Company, died on the 11th inst. at the City of Mexico.

John J. Weaver, of Philadelphia, Pa., master plumber, died on the 14th inst. He was a member of the Franklin Institute and one of the originators of the Master Builders' Trade Schools.

Samuel Osborn, of the firm of Samuel Osborn & Co., Clyde Steel and Iron Works, Sheffield, England, died on the 7th inst. He was the Mayor of Sheffield, and founded and developed the Clyde Steel and Iron works, whose business is now extended to nearly all quarters of the globe.

David Stewart, President of the American Coa Company, of No. 1 Broadway, died on the 17th inst., at the Hotel Champlain, Clinton County, N. Y., at the age of 80. He was a native of Jamaica, L. I. He was a member formerly of the dry goods firm of Stewart & Paton, and afterward became identified with coal, iron, and banking interests.

James L. Crossett died at Alameda, Cal., on the 4th inst. He was one of the pioneers of California, having arrived in San Francisco in the memorable year 1849. Upon his arrival there he engaged in business and remained there until the great fire of 1851 swept over the city and destroyed nearly all the business portion. After the fire he engaged in mining in Grass Valley, and in connection with John A. Collins built the first quartz mill operated there. In 1863 Mr. Crossett sold his mining property and removed to San Francisco.

Michael H. Wells, of Yankee Hill, Butte County, Cal., died last week. He was born in Philadelphia in 1829, and was one of the original Forty-niners who went to California during the gold excitement. He arrived in San Francisco in 1850, going around the Horn, and, after a few years' stay there, returned to the East. A few years later he went back to the Pacific coast and participated in all the excitement attending life in the gold regions during those early days. During the Indian outbreak of 1856 he was one of the company of 130 who garrisoned Fort Miner, 70 of whom fell at the hands of the savages. He lived in Butte County for over 30 years.

SOCIETIES.

The Secretary of the American Institute of Mining Engineers has issued the following circular: The Sixtieth Meeting will be held at Glen Summit, Luzerne Co., Pa., beginning October 6th. Notice of proposed papers should be sent as early as possible to the secretary. Special discussions are expected on the two following subjects: 1. The Preparation and Utilization of Small Sizes of Anthracite; 2. Practicable Uses of Concentrated Iron Ores. Written contributions to these discussions are invited, and advance notice thereof is requested.

INDUSTRIAL NOTES

The Burlington Air Ship Company, incorporated at Burlington, Ia., two months ago, with a capital of $10,000,000, dissolved on the 17th inst.

The Central Iron and Steel Company, of Brazil, Ind., has signed the Western scale of the Amalgamated Association of Iron and Steel Workers.

The Taylor Iron Works at High Bridge, N. J., it is said, are about to resume business on a larger scale than ever. The works have for a long time been running on half time.

The Pottsville Iron and Steel Company, Pottsville, Pa., began the work of blowing out the furnaces on the 16th inst., the strike, which began on the 2d inst., still being unsettled.

The Junction Iron Company's furnace, at Mingo Junction, O., is to have a new stack, the old one having been dismantled. The Standard Boiler & Bridge Company, of Bellaire, O., has the contract for the jacket and iron work.

The Raney & Berger Iron Company's No. 1 blast furnace, at New Castle, Pa., which has been practically dismantled for a long time, will be rebuilt this year. The new furnace will be built on the same lines as No. 2 furnace of that company.

The Glassblowers' Convention, in St. Louis, decided by a considerable majority to withdraw from the Knights of Labor. It is supposed the organization will affiliate with the Federation of Labor. No material changes in prices were made.

Subscription books for stock of the New York & New Jersey Bridge Company have been opened. The capital stock has been placed at $2,000,000, divided into shares of $100 each. The company has the privilege of increasing the capital stock to $5,000,000. On each share subscribed for $5 must be paid. As soon as 10,000 shares are taken the officers will be elected.

The strike of steel workers at the Allegheny Bessemer Steel Works, Duquesne, Pa., for recognition of the Amalgamated Association, ended on the 21st inst. in a victory for the firm. The mill was in full operation, and the strikers at a meeting decided it was useless to continue the fight, and declared the strike off. The men will now return to work upon the terms proposed by the company.

A fire occurred on the 20th inst. in the submarine cable department of John A. Roebling's Sons Company, Trenton, N. J. It was caused by the overheating of an oven in which a large cable was being baked. The cable caught fire, and the gas generated burst open the door, and considerable inflammable material near it was ignited. The building and its contents were destroyed, and the loss is about $50,000, partly insured.

The H. W. Johns Manufacturing Company has been organized by the consolidation of the following companies: H. W. Johns Manufacturing Company, Chalmers-Spence Company, Asbestos Packing Company, Chas. W. Trainer Company, Shields & Brown Company. The entire output of the above-named companies will be handled by the H. W. Johns Manufacturing Company. The office, of the new company will be at 87 Maiden Lane, New York.

The Pennsylvania Steel Company's works at Steelton, Pa., were partly shut down on the 22d inst., owing to the trouble over the scale of wages presented by the Amalgamated Association of Iron and Steel Workers. The machine shop, boiler-shop, foundry, and frog departments and blast furnace No. 3 are now in operation with a full complement of men, but all the other departments are closed. It is reported that the company will soon endeavor to resume in the idle departments with non-union men.

The extensive rolling mills, nail factories and furnaces of the Holidaysburg & Gap Iron Works at Holidaysburg, Pa., with valuable iron ore franchises, which until recently have been operated by Messrs. McLanahan, Smith & Co., Limited, were sold recently by the receiver, John Fichtner, to Martin Bell and M. F. Leason, attorneys for the second mortgage bondholders, for $30,525. The bondholders will either operate the works themselves or sell to outside capitalists.

The Congress of the Republic of Venezuela refuses to negotiate a reciprocity treaty with the United States upon the terms proposed by the United States Government, on the ground that the treaty stipulations would result in a serious loss of revenue to Venezuela without any compensating advantage to her own producers in the shape of increased prices for the agricultural products which they would be permitted, under the proposed treaty, to export to the United States free of duty.

Tubal C. Owen owns 1,500 shares of the capital stock of the Illinois Steel Company of the par value of $150,000. The company was organized with a capital stock of $25,000,000. At a meeting held on February 13th Owen presented a resolution increasing the capital stock from $25,000,000 to $50,000,000. It was declared adopted. Mr. Owen asks in a bill filed in the Circuit Court at Chicago on the 21st inst., an injunction to prevent the issue of the new stock. He says he offered the resolution under a misapprehension, and he has since discovered that the increase will not be for the interest of the corporation or its stockholders.

The situation at the Pencoyd Iron Works might be summed up as follows, says the Philadelphia *Ledger:* In April last the members of the Amalgamated Iron and Steel Workers' Association, who were in the employ of the firm, declined to work unless their employers would adopt the amalgamated scale of wages. This the firm refused to do. The iron puddlers struck; the firm ordered the fires drawn. Iron workers in other departments of the works joined in the movement. The firm addressed a circular to its employés in which the terms upon which work could be resumed were plainly stated. The statement was also regarded as an ultimatum. Since then one after another of the departments have been started up, until the entire works, with perhaps the exception of one mill, are now in operation.

Engineers Worthen and Parsons have completed a record of borings made by them for the purpose of determining how far below the surface of Broadway, this city, the rock lies. The distance to bed rock is reported as follows: *Whitehall Street*—Front street 20.00 feet, Water street 23.00, Pearl street 16.00, Bridge street 20.00, Stone street 21.00, Beaver street 34.00. *Broadway*—Morris street 35.25, Exchange alley 51.50, Rector street 63.10, Wall street 60.10, Pine street 70.00, Cedar street 70.75, Liberty street 70.90, Cortlandt street 70.30, Dey street 76.85, Fulton street 83.25, Vesey street 81.50, Barclay street 101.15, Park place 112.50, Murray street 113.50, Warren street 109.20, Chambers street 100.75, Reade street 116.00, Duane street 163.50, Thomas street 138.50, Worth street 147.60, Leonard street 96.55, Franklin street 83.45, White street 105.50, Walker street 107.20, Lispenard street 68.25, Canal street 87.65, Howard street 50.00, Grand street 70.80, Broome street 47.75, Spring street 70.10, Prince street 70.00, Houston street 105.60, Bleecker street 66.15, Bond street 68.85, Third street 53.00, Fourth street 40.10, Washington place 34.55, Waverley place 48.85, Astor place 49.75, Clinton place 65.25, Ninth street 35.25, Tenth street 40.33, Eleventh street 31.15, Twelfth street 22.00, Thirteenth street 34.00, Fourteenth street 13.35, Seventeenth street 10.15, Twenty-first street 17.00, Twenty-third street 21.50, Twenty-fifth street 24.00, Twenty-seventh street 19.20, Thirtieth street 15.00, Thirty-third street 4.00.

SOUTHERN INDUSTRIAL NOTES.

(From our Special Correspondent.)

The De Bardeleben Coal and Iron Company's idle furnace at Oxmoor has been blown in so that all the furnaces of the company are now in blast.

The Pioneer Mining and Manufacturing Company's Thomas furnace No. 1 has recently been blown out for repairs after making one of the best records in the South, 110,200 tons of pig iron, valued at $1,250,000, having been turned out during the run.

The annual meeting of the stockholders of the Jenifer Iron Company was held at the company's offices at Jenifer, Ala., on the 9th inst. All the old officers were re-elected except George A. Noble, who declined to serve longer. W. D. Fildes was elected secretary and treasurer in his place. The furnace has been closed down for repairs for some time, but will go into blast at once.

The West Virginia Flint Glass Bottle Company, with works at Central City (Huntington P. O.), W. Va., has been incorporated with a capital of $75,000, with the privilege of increasing to $200,000. D. Joy, L. A. Cross and L. H. Cox, of Findlay, Ohio, are promoters of the enterprise. The Central City Window Glass Company, with works at the same place, has been organized with a capital of $50,000, with the privilege of increasing to $100,000. D. Joy, F. H. Marrical and others are the incorporators.

MACHINERY AND SUPPLIES WANTED AT HOME AND ABROAD.

If any one wanting Machinery or Supplies of any kind will notify the "Engineering and Mining Journal" of what he needs, his "Want" will be published in this column.

Any manufacturer or dealer wishing to communicate with the parties whose wants are given in this column can obtain their addresses from this office. No charge will be made for these services.

We also offer our services to foreign correspond-

ents who desire to purchase American goods, and shall be pleased to furnish them information concerning American goods of any kind, and forward them catalogues and discounts of manufacturers in each line, thus enabling the purchaser to select the most suitable articles before ordering.

These services are rendered gratuitously in the interest of the subscribers and advertisers; the proprietors of the "Engineering and Mining Journal" are not brokers or exporters, nor have they any pecuniary interest in buying or selling goods of any kind.

GOODS WANTED AT HOME.

2,322. Twelve miles of 50-lb. rails and two miles of light T-rails, with joints, spikes, etc., sufficient to lay same. Florida.

2,323. Three locomotive, six horse, four gondola and ten mine dump cars. Florida.

2,324. Roofing, either steel or tin. South Caroliana.

2,325. An anti-freezing force pump. Montana.

2,326. An elevator for a tobacco company. North Carolina.

2,327. Dynamo of not less than 500 candle power, and also an engine of about 100 horse-power early in the fall. Georgia.

2,328. A heading, turning lathe and crossing machine. Georgia.

2,329. Assayers' goods. New Mexico.

2,330. Wanted, the address of the manufacturer of the Vapart centrifugal disintegrator. New York.

2,331. A saw to be worked by horse power in cutting cord wood into suitable lengths for fire places. New York.

2,332. A steam shovel capable of excavating 300 to 500 tons daily. New York.

2,333. A dovetail machine and a combined trimmer and ripping saw. North Carolina.

2,334. A 60 horse power automatic cut-off engine with a 70 or 80 horse power boiler. North Carolina.

2,335. Sheet metal press to stamp barrow trays, sufficiently large to take in a blank 45 × 45. Ohio.

2,336. A 16-ft. fan, a 16 × 20-in. engine, and a 50 horse power locomotive boiler. West Virginia.

2,338. Machinery for grading. West Virginia.

2,339. A small, second-hand locomotive; must be very small for hauling miner tram cars up 2% grade, 3-ft. grade. Alabama.

2,340. A mineral indicator. Alabama.

AMERICAN GOODS WANTED ABROAD.

2,321. Furnace using gaseous fuel for the reduction of tin ore. Peru.

2,337. A magnetic separator to separate magnetite from blende. France.

GENERAL MINING NEWS.

TENNESSEE COAL, IRON, AND RAILROAD COMPANY.—The coal mines of this company at Briceville, Anderson County, Tenn., have been the seat of a miniature war during the past week. About ten days ago a gang of convicts was sent to work in the mines. The miners of the district, who are, as it is well known, strenuously opposed to this form of contract labor, overpowered the guards and compelled the withdrawal of the convicts. In the beginning of the week the latter were returned to Briceville escorted by several companies of militia, comprising about 200 men. The force was surrounded by a body of about 2,000 miners and other citizens of the district, strongly armed, and was compelled to retreat with the convicts to escape annihilation, which the mob threatened. The mob was perfectly orderly in other respects and the property of the company was injured in no way. Gov. Buchanan, to enforce the laws of the state, thereupon called out the entire force of militia, which is now at the scene of war. The miners continued to declare their intention of preventing the employment of convicts in these mines. They stated that they would do all in their power to avoid violence and bloodshed, but that they would free the convicts as soon as the militia retired. On the 22d inst. Governor Buchanan met a committee of the miners at Knoxville to discuss the matter. He stated that before he left Nashville he had decided to call an extra session of the legislature, and had already made a call for an election to fill vacancies in that body; that in his call for a special session he will embody a recommendation to the legislature that the convict lessee system be modified, if not repealed; that in the meanwhile, pending the election, the convicts must be returned to the Briceville mines from which they have been evicted; and that if the miners agree not to molest them until such time as the legislature may act, the militia will be sent home. The committee of miners having no power to act left for Briceville on the following morning to submit this proposal. At a meeting of the miners held subsequently it was agreed that they would take no further action in the matter for 60 days, if the extra session of the legislature be called before that time.

ALABAMA.

LAWRENCE COUNTY.

(From our Special Correspondent.)

LAWRENCE COUNTY OIL, GAS AND MINERAL COMPANY.—This company has recently been organized with a capital stock of $200,000, for the purpose of boring for oil and developing a large tract of land comprising 30,000 acres. The property adjoins that of the Goyer Oil Company, upon which is a very successful 30-barrel well. The offices of the company are at Sheffield, Ala. The officers are S. S. Hawthorn, president, Polk Laffoon, vice-president, and W. A. Ellis, secretary and treasurer.

ALASKA.

Last April Lieut. E. J. Glave, the well-known African explorer, and Jack Dalton, an experienced prospector, started from Seattle to explore the interior of Alaska. A letter has been received from Glave, dated June 9th, in which he says: "We have been entirely successful with our venture of taking a pack-horse into the heart of Alaska. The attempt was considered by many quite quixotic, but I am writing this from one of the most central parts of inner Alaska, from a part of the land entirely different from the snow-covered heights so popularly supposed to be the only grounds in these regions. From my present position an immense valley, thickly covered with luxuriant grasses, stretches away for miles in all directions. Alaska's inaccessibility has kept the country undeveloped, but now that we have proved that transportation by pack-horses is practicable, nothing is to prevent Alaska at once assuming an important position as a mineral-producing region. Alaska is encircled at all limits by rugged walls. When the difficult barriers are crossed, a splendid country is reached, with deep, swift streams and lakes well stocked with fish, and fine pasture and wild fruits in abundance. The winter is severe, but not so dreadful as generally supposed. With the practicability of pack horse transportation proved, nothing should hinder an important mining return to Alaska."

ARIZONA.

PINAL COUNTY.

MAMMOTH GOLD MINES, LIMITED.—The bullion output during June was $17,300. The mill ran for the most part on ore of very low grade; the bullion yield was, consequently, below the average.

CALIFORNIA.

California may show at the World's Fair, as a part of its exhibit, the finest collection of minerals in the United States. Instead of making a special collection, as was done for the New Orleans, Philadelphia, and Paris expositions, there is a strong probability that the state will send the magnificent collections belonging to the State Mining Bureau Museum. The State University has the collection of the State Geological Survey, the Voy collection, Hanks collection, Keene collection, and several others. These are all classified, arranged, identified, and labeled. Each county and district in the state is properly represented. Every department of the mining industry has its separate place with locality indicated.

(From our Special Correspondent.)

The hydraulic mining men continue to preserve a calm and dignified attitude towards the opposition of the Anti-Debris Association. This week S. M. Sprague, J. F. Brown and M. R. Gleason, on behalf of the citizens of Iowa Hill, Placer County, appeared before the supervisors and presented a petition requesting them not to ask for a permanent injunction against the hydraulic mines until they were visited and examined. Accompanying the petition was another bearing the signatures of many of the leading merchants and business men of Sacramento, who also impressed upon the supervisors the desirability of inspecting the mines before proceeding in a wholesale fashion with the injunction suits, which now number between twenty and thirty.

AMADOR COUNTY.

PLYMOUTH CONSOLIDATED GOLD MINING COMPANY.—Mr. H. W. Lazelle, secretary of this company, has issued the following financial statement to July 1st. Surplus January 1st, 1891, $22,258.93. Miscellaneous receipts, $2,350.16. Gold bullion produced: April, $5,812.68; May, $3,011.96; June, $4,305.91; total, $37,739.64. Expenses; January, $2,313.68; February, $2,496.39; March, $2,605.76; April, $3,049.84; May, $3,016.22; June, $3,493.50. Total, $16,975.39. Surplus, $20,764.25. He also says: "Since the last statement further progress in the upraise developed the existence of a valuable body of ore. It gradually widened to 6 ft., and is of good grade. When work was suspended the upraise was nearly 200 ft. high. With so favorable an outlook the management felt justified in commencing a new tunnel in order to work the newly discovered rock advantageously. Operations elsewhere were suspended July 1st, while a station is being cut out for the new tunnel. We hope to start the mill again when the station is ready, probably about July 20th. The work can then progress in both tunnels, and we expect to keep the mill going continuously. Some repairs will be needed on No. 2 tunnel, which ought to be completed before the end of August. The new tunnel now being run to ore will take a number of months to finish. Until that time we can run but few stamps, but after completion the output should be largely increased. We are giving attention to the extensive water property of the company. This will ultimately produce a considerable income."

VOLCANO DIAMOND AND GOLD MINING COMPANY.—This company was recently organized in San Francisco by Senator Walrath as president; A. Swift, N. G. Young, I. Birnbaum and S. H. Douglass Biltz. The company is capitalized at $1,000,000, shares $10 each, of which sum a large amount is said to have been subscribed. The company has acquired a property at Volcano, valuable not only for gold, but also for diamonds, according to State Mineralogist Irelan's report for 1888.

BUTTE COUNTY.

(From our Special Correspondent.)

SHAKESPEARE.—This property, which is being developed by W. Hayward, bids fair within a short time to be one of the most important in the county. The tunnel has been run in about 1,500 ft., and a shaft which is being sunk on the hillside is now down over 80 ft., having quite recently tapped the tunnel. Quartz was struck 20 ft. down. A considerable amount of ore is already on the dump.

PLACER COUNTY.

MORNING STAR GRAVEL MINING COMPANY.—Regular monthly dividend No. 4, of $2.50 per share, has been declared. The property is located at Iowa Hill. The capital stock of the company is 2,400 shares. The three preceding dividends were of $1.50 per share. The surplus in the treasury is to be used to make needed improvements at the mine.

SAN BERNARDINO COUNTY.

(From our Special Correspondent.)

SAN JACINTO ESTATE, LIMITED.—The erection of a new mill at the Temescal was commenced last week. The mill will have four pneumatic stamps and ten new concentrators. The stamps have arrived from Birmingham, England.

COLORADO.

According to newspaper reports, the Silverton Railway, known as the "Rainbow Route," has been purchased by an English syndicate composed largely of shareholders of the Yankee Girl, New Guston and American Belle companies. It is over this road that the ore of the Red Mountain mines is shipped.

CLEAR CREEK COUNTY.

CENTENNIAL.—The 500-ft. level has been driven about 130 ft. each way, through a continuous body of ore, in places 4 and 5 ft. in width, says the Georgetown *Courier*. About 25 per cent. of the mineral taken out is smelting ore, consisting mainly of iron and copper pyrites, with a little galena, blende, and gray copper. The ore from the west drift has been found to be much more valuble than that from the east drift, carrying in gold and silver about $150 per ton. The ore when mixed mills about $50 per ton. The 400-ft. level is being put in repair.

DOLORES COUNTY.

ENTERPRISE MINING COMPANY.—This company has been organized under the laws of New Jersey, with a capital stock of $2,500,000 in 500,000 shares of $5 each, to take over the Enterprise and Jumbo groups of mines, located on Newman Hill, near Rico, which were recently purchased by Messrs. Crawford and Posey. Of the capital stock of the company 400,000 shares are offered for subscription, books opening July 27th and closing August 3d, $1 per share being payable upon application, $2 upon allotment and $2 August 25th. The directors of the company are Lloyd I. Seamen, of New York, president; George Crawford, of New York, secretary and treasurer; Hugh L. Cole, of New York; John E. Ward, of Morristown, N. J.; James McKay, of Pittsburg, Pa.; William M. McKelvy, Oliver P. Posey, of Whitewater, Wis.; W. B. Wiliams, of Chicago, and William A. Boland, of Boston. The property to be acquired consists of the Enterprise, Laura, Eureka, Onta io, Hiawatha, Kitchen Bell, Night Watch, Snow Flake, Song Bird, Thompson and Anaconda claims, composing the Enterprise group; the Jumbo and Headley claims, composing the Jumbo group, and the Group and Onomoo Tunnel sites. These claims comprise an area of about 125 acres. The Enterprise mines, which are the most famous in the Rico district, commenced to produce in 1888. Between that time and April 3d, 1890, their output has amounted to 2,250 tons, of which the net value was $793,758.93. The Jumbo group produced 312 tons of ore in 1890, returning $102,501.30, the total for the two properties being $896,260.23. The ore body in these mines lies in a contact vein between limestone and porphyry. The output up to the present time has been almost entirely from development work, by which a great extent of ground has been opened. A noticeable feature of this ore body is its phenomenal richness. The grade of the ore shipped from the Enterprise mines hitherto has ranged between 0·5 oz. and 5·32 oz. gold and 160 oz. and 604 oz. silver per ton; 3·90% and 26% lead. The promoters of the company expect to declare $1,000,000 in dividends in the first year of operation. Mr. Geo. Crawford, managing director of the Yankee Girl, New Guston, American Belle, Ute & Ulay and Silverton mining companies, will be the general manager of the Enterprise.

GUNNISON COUNTY.

COLORADO MARBLE COMPANY.—This company is making preparation to work its quarries, beginning with the construction of a wagon road from Crested Butte thither.

LAKE COUNTY.

It is stated that an important consolidation of mining property in Leadville has been effected and that a deep shaft for its exploration will soon be commenced. Messrs. David Moffat and Eben Smith, of the Maid of Erin Silver Mines, Limited, and Maj. A. V. Bohn, who represents Ex Gov. Tabor in Leadville, are said to be interested in the undertaking. This consolidation comprises more than 50 acres on the southwest slope of Carbonate Hill, extending within a few blocks of Harrison avenue, between East Second and East Sixth streets. The claims embraced are the Pocahontas, Grey Eagle, Crown Point, A. V. B., Little Rooster, Valentine, Penrose, Washburn and a larger portion of the Alice Placer. In the Pocahontas and Penrose and Valentine mines ore has already been discovered, that in the Valentine shaft, which lies near the corner of Third and Poplar streets, having been cut with a diamond drill. All of these properties lie southwest of the Carbonate and Pendery faults and there is little doubt that the extension of the Evening Star and Carbonate ore chutes will be opened in them.

OURAY COUNTY.

NEW GUSTON COUNTY, LIMITED.—The ore shipments in June amounted to 1,200 tons, the estimated value of which was $92,975, and the expenses were $16,525. The superintendent of the mine reports that it never looked so well in its history as at present. The new ore body opened by a drift on No. 5 level, and a raise from No. 6, has greatly improved, the ore assaying from 90 to 700 ozs. silver per ton. The work of sinking the main shaft deeper has been recommenced. The company has declared an interim dividend for the second quarter of the year amounting to 2s. per share or $55,000, together with a bonus of the same amount, making a return to shareholders of 40% for the preceding half year. A large balance of undivided profits is carried forward to revenue account. The total dividends declared by the company from November 15th, 1888, to date, amount to 31s. 6d. per share.

YANKEE GIRL SILVER MINE, LIMITED.—Shipments from the mine in June amounted to 1,300 tons, of which the estimated value was $103,305; expenses were $27,270. The directors have declared a dividend of 2s. per share, amounting to $130,000 payable. This makes 8s. per share or 45% on the capital of the company during the past fiscal year. The mines continue to look well. In the No. 1 stope in the Robinson mine there is one point where the ore body is 30 ft. in width. This stope is now 87 ft. long and 90 ft. high. The average width of the ore is 3 ft. and it carries from 30 to 1,200 ozs. silver per ton. In No. 1 stope of the south drift of the 4th level, the ore is 20 ft. wide at one place. This stope is 41 ft. high and 156 ft. long, the average width of the ore being 2 ft., and its grade from 25 to 250 oz. silver per ton. In the Yankee Girl mine the north ore body has been proved to be a spur from the main chimney. The Orphan Boy mine is producing ore from the west ore body which carries from 10% to 18% copper.

PUEBLO COUNTY.

PUEBLO SMELTING AND REFINING COMPANY.—Orders were given on the 14th inst. by the management of this company for the resumption of work in the copper plant, which has been idle for almost a year. It is expected to get everything in shape for starting by August 1st. Employment will be given to about 200 men, and it is expected that 300 carloads of ore per month will be handled.

SUMMIT COUNTY.

BOSTON MINING COMPANY.—Work has been resumed in the St. Johns mine, a reorganization of the company having been effected, and an output of from 100 to 150 tons of ore per month is now being made. The dressing works are to be rearranged and put in operation. This mine, which has been the largest producer and most extensively developed mine in the Montezuma district, was opened in 1869. The company ceased operations in 1876, since which time it has been operated in a desultory manner by parties of tributers until this year.

FLORIDA.

(From our Special Correspondent.)

CROWN AND CRESCENT PHOSPHATE MINING COMPANY.—In our issue of the 27th ultimo mention was made that James A. Harris and Albertus Vogt had sold to a syndicate 4,900 acres of phosphate lands in Citrus, Hernando, Levy, Marion and Polk Counties for the sum of $570,000 in cash, they retaining fifty-one one-hundredths interest. The Crown & Crescent Phosphate Mining Company has been organized to take over this property. Mr. Harris is president of the company, and Mr. Vogt general manager. Its capital stock is $1,000,000. It is said that English capitalists are interested in the enterprise.

ALACHUA COUNTY.

(From our Special Correspondent.)

HIGH SPRINGS PHOSPHATE COMPANY.—This company has been organized with a capital stock of $500,000, for the purpose of developing about 1,900 acres of phosphate lands in this county. Messrs. Barrs and Clark, of High Springs, are the promoters of the enterprise. The principal office of the company is at Jacksonville.

SEMINOLE HARD ROCK AND LAND COMPANY.—This company has been organized at Jacksonville for the purpose of developing a large tract of phosphate lands in the neighborhood of Archer, known as the Shell Pond tract. The capital stock of the company is $1,250,000. The officers are: J. L. Davis, of Springfield, Ill., president; C. B. Rogers and A. O. McDonnell, of Jacksonville, respectively vice-president and secretary and treasurer.

GEORGIA.

COBB COUNTY.

(From our Special Correspondent.)

AMERICAN MARBLE COMPANY.—This company's property, which has been for some time in the hands of a receiver, was sold at auction on the 7th inst. The company was incorporated under the laws of the state of Maine, and in 1887 erected an extensive plant in the fork of the Western & Atlantic and the Marietta & North Georgia railroads, about 1½ miles north of Marietta. In July of the same year, a first mortgage to secure a bond issue of $1,000,000 was filed. The company succeeded in negotiating about $270,000 of these bonds at par. As it failed to pay its obligations a receiver was asked for and Mr. George Newell was appointed. The assets of the company amount to about $75,000, and the liabilities to $300,000. The property was bought by the Georgia Marble Company and prominent Marietta capitalists, who will organize a new company, and will resume work on a larger scale than before.

LUMPKIN COUNTY.

(From our Special Correspondent.)

FISH TRAP.—W. L. Agnew has leased this mine and mill, and has begun work in the mine, and is putting the mill in repair preparatory for a run. This property belongs to the Dahlonega Company, Limited, and has been in litigation for some time. There are 30 stamps in the mill, only a part of which will be started up for the present.

HAND GOLD MINING COMPANY.—It is stated that a fine body of ore has been opened in the Barlow Cut, formerly known as the "Dog Head" vein. A test run is being made of the ore, and if the expectations are realized the 40 stamps of this mill will make a good showing for the next few months. This has always been the most paying of the several properties of the Hand company, its 40 stamps frequently producing more bullion than the remaining 100 dropped by the company.

LOCKHEART.—Mr. Crisson has leased this property, owned by the Dahlonega Company, Limited, and is putting the mine and mill in running order. There are 20 stamps in the mill.

TEAL & ADAMS.—This mine and its 10-stamp mill were recently sold at sheriff's sale. They were purchased by William Skyrme, former superintendent of the Appalachian Gold Mine, Montgomery County, North Carolina, who had a claim against the Teal & Adams Company. The purchase price was $1,850.

IDAHO.

CUSTER COUNTY.

DICKENS-CUSTER MINING COMPANY, LIMITED.—The bullion product during June amounted to about $21,650. Mining and milling expenses were $12,950.

OWYHEE COUNTY.

DELAMAR MINING COMPANY, LIMITED.—There were crushed during June, 1,200 tons of ore, producing $37,000 in bullion. The estimated value of the smelting ore produced is $12,300. Miscellaneous receipts amounted to $800, the total thus being $50,100. The total expenses were $23,100. During the second week of the month various milling experiments were tried, thereby reducing the regular output.

STODDARD.—Mr. John D. Ludwig, agent for Senator John P. Jones, has secured a year's extension on his option on Mr. C. M. Hays' interest in this mine. Arrangements will probably be made for exploiting this property to a greater depth. The greatest depth as yet attained is only 128 ft.

ILLINOIS.

COAL.

At the annual meeting of the State Board of Labor Statistics, held in Springfield on the 15th inst., Richard Ramsay, of Braceville; William Scaife, of Coal City; George Simpson, of Springfield; Hugh Murray, of Sparta, and John Goldby, of Gillespie, were appointed a board to examine candidates for positions as state mine inspectors and managers of coal mines. The board will meet at Springfield on the second Monday in September. Those who pass satisfactory examinations are reported to the Governor, and from this number the five State Inspectors provided by law must be chosen.

The strike of the coal miners at Spring Valley has been settled on their own proposition, which includes the gross weight system of weighing in accordance with the new law, and semi-monthly pay days; other conditions to be the same as last year. It is reported that the mines, which have been idle since May 1st, will be started up at once.

A dispatch from Danville on the 22d stated that both the miners and operators in that vicinity seemed determined to force an early decision by the upper courts regarding the mining laws passed by the last Legislature. L. Spellman, who was a representative, is also a heavy coal operator. He was fined $50 by a justice of the peace on the 20th inst. for running a truck store. Spellman pays his men cash and claims he has the right to run a store. He has taken an appeal. Michael Kelly was also fined $25 for a violation of the Gross Weight bill. Kelly pays his men by the day and he will appeal. At Hillsborough all the miners have quit work because the company has not yet complied with the weekly payment law. It is not likely that the strike will continue long, however, as both sides are said to be willing to compromise. The company has heretofore paid the men every two weeks.

MICHIGAN.

COPPER.

The River and Harbor and Commerce Committees of House and Senate, under guidance of Congressman Stephenson, inspected the Portage Lake canals and the copper mining interests of Houghton County last week.

AI LOUEZ MINING COMPANY.—Recent rains have enabled this company's mill to resume operations. Later advices are to the effect that the mill was started and is running in a satisfactory manner.

CENTENNIAL MINING COMPANY.—Superintendent Vivian writes, July 13th: No. 6 shaft is down to the 5th level, making it from the surface 580 ft. The lode in this opening is small and poor. The lode in the 4th level north is improving, both in size and value. The 3d, 2d and 1st levels are opening ground that will pay to stope. We have started to explore for the lode about 725 ft. north of No. 6 shaft, where we expect to sink another, or No. 7, shaft. The productive ground continues to dip to the north very fast; consequently, it will be necessary to open another shaft as fast as possible. By the time you get this we shall, if all goes as we expect, be stamping. We have had steam on the stamp head, which works well.

IRON—MARQUETTE RANGE.

REPUBLIC MINING COMPANY.—Fire broke out in No. 5 shafthouse of this company's mine at 1 A. M. on the 20th inst. The surface fire was extinguished, but not before it had communicated to the timber of Nos. 5 and 6 shafts. Later accounts were to the effect that the fire was spreading underground. On the 21st inst. Peter Pascoe, Jr., son of Superintendent Peter Pascoe, of the mine, and James Dower, Jr., descended into the mine by No. 7 shaft with three others, to ascertain the extent of the fire raging in Nos. 5 and 6. The whole party was overcome by the smoke. Pascoe's companions reached the skip and were drawn up unconscious, but he fell by the way. James Dower descended twice into the smoking shaft to rescue Pascoe. The first time he was accompanied by four men and the whole party was drawn up unconscious. The second time Dower went down alone and never returned alive. The bodies of Dower and Pascoe were taken out three hours later.

(By Telegraph.)

The fire in the Republic mine that started at 1 A. M. on the 21st inst. is still raging beneath the surface. It started in No. 5 shafthouse, and so on spread through the upper levels into shafts 6 and 7. The Ely shaft and Morgan and No. 1 pits are working as usual, not being connected with the workings in which the fire is burning. The mine is so wet that the fire will not extend below the third level. The cave-in at 5 and 6 is quite serious. It is feared the engine house may fall into the chasm. The fire is under control and cannot possibly extend further. The loss will be heavy.

IRON.—MENOMINEE RANGE.

The Menominee *Democrat* thinks it probable that the Chicago, Milwaukee & St. Paul Railway Company will build an ore dock at Menominee at an early day. The road now owns and operates the M. & N. line, which has a branch to Menominee, its main line tapping both the Menominee and Marquette iron ranges. The *Democrat* states that surveyors were in the city all last week making surveys and examinations of proposed sites for the ore dock. Three sites are under consideration and reports on all of them will be submitted as soon as possible.

ARAGON.—At this mine about 400 tons of ore per day are being mined, and about 16,000 tons are still in stock. The stopes are being cut out at the 5th level and the output will soon be materially increased. At No. 2 shaft the sinking to the 6th level is in progress; a pocket is being built, and hoisting of ore will soon begin.

LUMBERMAN'S MINING COMPANY.—At the Ludington mine the working force has been divided into three shifts of eight hours each. About 600 men are employed.

PENN IRON COMPANY.—Mr. J. E. Hagey, general manager of the company's mines, has resigned, says the Norway *Current*. General Superintendent William Kelly will probably be his successor. Mr. Hagey has accepted a position as general manager of the Cambria Iron Co.'s stores in Pennsylvania, and will make his future home at Johnstown, Pa.

SANDSTONE.

KEWEENAW REDSTONE COMPANY.—This company has secured the lease of the Newton homestead of 160 acres at Newtonville, and is opening a sandstone quarry there. A contract for a large amount of stripping has been let and the contractors began work July 3d. A complete equipment of machinery for the quarry has also been

secured and will soon be on the ground. It is known that a 7-ft. layer of first-class redstone exists on the property from the ledge showing on the lake shore. The deposit has been followed for half a mile across the property.

MISSOURI.

JASPER COUNTY.

(From our Special Correspondent.)

JOPLIN, July 20.

The fine weather of the past week and the advance in the price of ore was the cause of a heavy output. The average price of zinc ore was $23 per ton, while $25.50 was paid for some choice lots. Lead declined and sold at $25 per thousand. Several companies at Carterville sold their surplus stock at the advance price.

Following are the sales from the different camps as far as reported:

Joplin Mines, 1,737,630 lbs. zinc ore and 162,810 lead; value, $24,052.25.

Webb City Mines, 389,520 lbs. zinc ore and 94,420 lead; value, $6,843.

Carterville Mines, 2,441,387 lbs. zinc ore and 91,220 lead; value, $30,357.50.

Zincite Mines, 393,940 lbs. zinc ore; value, $4,925.

Galena, Kans., Mines, 932,127 lbs. zinc ore and 57,740 lead; value, $11,775.

District, total value, $77,252.75.

Aurora, Lawrence County, mines, 520,000 lbs. zinc ore, 640,000 silicate and 218,000 lead; value, $15,350.

Lead and zinc belts, total value, $92,602.75.

Pittsburg-Kansas spelter output: R. Lanyon & Co., 189,850 lbs.; S. H. Lanyon & Bro., 96,900 lbs.; N. & J. Lanyon, 96,850 lbs.; Granby M. & S. Co., 97,000 lbs.; Weir City Zinc Co., 186,000 lbs.; Pittsburg & St. Louis Zinc Co., 75,700 lbs.; total, 742,350 lbs.

MONTANA.

BOSTON AND MONTANA CONSOLIDATED COPPER AND SILVER MINING COMPANY.—The contract for this company's new steel buildings at Great Falls, according to the Great Falls *Leader*, has been awarded to the Berlin Iron Bridge Company, of East Berlin, Conn. The buildings are to be 230 x 455 ft., the roof to be of corrugated iron, supported by steel trusses and columns. The company has contracted to complete the building before December 1st. According to report, the contract amounts to about $58,000. The machinery for the smelter is to be supplied by Messrs. Fraser & Chalmers.

BEAVERHEAD COUNTY.

GOLDEN LEAF, LIMITED.—During June the mill at Empire worked 60 stamps for 28 days and crushed 5,000 tons, the yield being as follows: Bullion, $10,600; sundries, $1,300; total, $11,900. The working expenses for the month were, $8,500. The amount expended on capital account was $2,000. The ore body in the lowest level of the Empire mine is 5 ft. in width, assaying $9 in gold per ton.

LONE PINE.—A dispatch from Helena says that this group of mines, in the Vipond District, has been sold to an English syndicate for $725,000. The property consists of the Lone Pine, Horace Greeley, Excelsior, Ben Harrison, Silver King, Silver Star, Luna, and Fraction claims.

JEFFERSON COUNTY.

ELKHORN MINING COMPANY, LIMITED.—During the month of June the mill ran 28 days and crushed 902 tons of ore. Bullion shipped was valued at $37,580; smelting ore sold (310 tons), $16,600; total produce, $54,180. The total expenses were $23,805.

LEWIS AND CLARKE COUNTY.

MONTANA COMPANY, LIMITED.—The amount of ore crushed in June was 6,229 tons, yielding $55,400; expenses amounted to $45,200.

NEVADA.

(From our Special Correspondent.)

SAN FRANCISCO, July 16.

CONSOLIDATED CANDELARIA MINING COMPANY, LIMITED.—There was crushed during the past week 295 tons of ore from the Holmes mine. Crude bullion on hand 699 lbs.; amalgam on hand 3,150 lbs.; bullion shipped valued at $17,000. The average battery assay was $31 per ton. Some alterations have been made in the Candelaria mill, including connections for a machine shop. A suction fan and dust collector have been put in to take the dust from the batteries. It works automatically, the heavier dust being collected and worked through the furnaces.

EUREKA COUNTY.

EUREKA CONSOLIDATED MINING COMPANY.—On July 8th, 1891, $16,500 worth of bullion was shipped; on July 10th, $11,000, and on July 19th, $12,000.

LANDER COUNTY.

BIG CREEK ANTIMONY COMPANY, LIMITED.—H. H. White has made a contract with this company to freight ore from the bottom of the tramway at Big Creek to Battle Mountain. It will be hauled by wagon to Austin Junction, a distance of about 12 miles, whence it will be transported by rail to Battle Mountain. From the latter place it goes to New Orleans, via San Francisco, where it is taken by steamer to its destination, Liverpool, England.

PITTSBURG CONSOLIDATED GOLD MINING COMPANY.—The product of the mines during June amounted to $11,400. Expenses were $9,400.

(From our Special Correspondent.)

P. E. Shannon's mine on Galena Hill, about one mile from the line of the Virginia & Truckee Railroad, is beginning to get into good shape. For years small interest holders have obstructed work, but a consolidation of interests has been effected and a U. S. patent granted to Mr. Shannon. Two tunnels have been driven for a considerable distance and several drifts, inclines, and winzes have opened up the property to some extent. So far between 500 and 600 tons of ore have been extracted the assays showing the ore of lowest grade to run 15 oz. silver and 40% to 45% lead. The higher grade ore assayed 60 oz. silver and 60% lead, with traces of gold. The work done so far has been mostly surface work, but now it is intended that the property shall be thoroughly developed and the extent of the deposit ascertained. The ore is of a free smelting character. The heavy freight charges is a serious drawback and Mr. Shannon is desirous of erecting a smelting plant at the mine during the coming season.

LYON COUNTY.

OEST.—It is reported that a valuable body of ore has been opened in this mine at Silver City. The present owners bought the property in at Sheriff's sale recently for $19,000.

WASHOE COUNTY.

RENO REDUCTION WORKS.—The suit of the State of Nevada against this company, involving the right to the use of the waters diverted from the Truckee River by the dam at the works, was dismissed on the 6th inst. in the Supreme Court upon motion of the Attorney-General. This will doubtless result in the rebuilding of the works, says the Reno *Journal*, which will not only benefit Reno, but miners along the Central Pacific and Carson & Colorado railroads.

STOREY COUNTY—COMSTOCK LODE.

The Virginia Miners' Union of Virginia City has elected the following officers: President, T. H. Smith; vice-president, Henry Hatteral; financial and recording secretary, Bernard Coyle; treasurer, M. Young; conductor, Jerome Quinlan; warden, W. Tickell; library directors, L. Lobenstein, Michael Carroll, Peter Malloy, John F. McDonnell, Walter H. Pearson; trustees, M. O'Meara, Frank Upton, J. B. Kendell, Michael James, H. Burke; finance committee, Daniel O'Sullivan, Malachi Norton, Matthew Senote.

BEST & BELCHER MINING COMPANY.—At the recent annual meeting of the stockholders of the company, 88,667 shares were represented, and the following board of directors was elected for the ensuing year: George R. Wells, president; A. K. P. Harmon, vice-president, and Thomas Anderson, J. B. Low and Robert Sherwood, trustees. L. Osborn was re-elected secretary and P. Kerwin superintendent. The secretary's report shows an indebtedness of $19,000.

(From our Special Correspondent.)

SAN FRANCISCO, July 16.

ALTA SILVER MINING COMPANY.—The cable broke last week and the bailing tanks had to be stopped for a time, but have since been running regularly. About 1,200,000 gallons of water are being raised every 24 hours, and at this rate the water will be lowered to the 1,400 level within 30 days, when prospecting will be resumed at this point. The first two days the tanks were running they lowered the water in the Alta shaft 95 ft., but the effect was not felt in the Crown Point incline.

CROWN POINT MINING COMPANY.—Two sets of station timbers have been renewed at the 1,700 station, and during the current week work will be commenced excavating for the stationary pumps.

CONSOLIDATED CALIFORNIA & VIRGINIA MINING COMPANY.—On the 1st inst. there was in the company's treasury $229,145.17, so that the dividend, aggregating $108,000, paid on the 17th inst., will by no means deplete the reserve fund. It is worthy of notice that the Virginia City papers have at length conceded that the ore deposit known as Senator Fair's "Baby," and by him pronounced to be larger and richer than the "Daddy," is not a myth but a very pronounced reality. Superintendent D. B. Lyman is about to take a vacation, and during his absence John W. Mackay will personally direct the operations in this and the other north end mines of which Mr. Lyman is superintendent.

KENTUCK CONSOLIDATED MINING COMPANY.—The north drift from the 1,000 level east raise is showing low-grade quartz in the face. The west crosscut from the top of the north raise, 1,000 level, is out 12 ft., and has cut a streak of pay ore 18 ins. in width, which assays $13 to $27 per ton.

OVERMAN MINING COMPANY.—At the annual meeting 98,342 shares were voted, the following directors being elected: W. G. Morrow, president; W. W. Stetson, vice-president; J. H. Dobinson, J. P. Martin and M. Schmidt, directors. G. D. Edwards was reappointed secretary; R. F. Morrow, treasurer, and A. Lackey, superintendent. During the month the bullion shipments from the mine aggregated $38,012.18, but the company has overdrawn to the tune of $30,848.99. Good ore is being stoped from the drift southwest of the shaft, 900 level. A rumor has been current that a rich strike had been made at this point, but its only foundation was the uncovering of a rich but small bunch of ore.

SAVAGE MINING COMPANY.—During the week 400 tons of ore were crushed at the Mexican mill, the average battery assay being $17.67. The E street tunnel has been run 950 ft. and connected with the old Salino shaft which has been sunk in the west ledge. The west drift from new station, Potosi tunnel level, has been extended 196 ft. from the shaft. A west drift from top of raise, 950 level, will connect this week with bottom of winze from 800 level, when ore will be extracted from this portion of the mine.

WEST CONSOLIDATED VIRGINIA MINING COMPANY.—The annual meeting called by the minority stockholders for the 15th inst. did not take place, inasmuch as a restraining order had been issued preventing Oscar Steele and others from voting the stock in their possession. The old Board of Directors will thus retain office for another year.

NEW JERSEY.

IRON.

BELVIDERE.—The Thomas Iron Company, of Pennsylvania, has leased these iron mines from R. C. Fellows, and will put up machinery of sufficient capacity to work the mines. The company will employ a large force of men.

NEW MEXICO.

An important discovery of gold is said to have been made recently between San Pedro and Bernalillo, near the line of Santa Fé and Bernalillo counties. The region is supposed to be a continuation of the San Lazarus gold belt, upon which the San Lazarus and San Pedro is located. The gold is found in decomposed rock, and, being free, is easily washed out. From 5 to 25 cts. to the pan has been obtained. The new region lies along a stream known as Ojo de la Casa, and over 100 claims have already been located.

GRANT COUNTY.

The freight and express shipments of bullion, ore and concentrates from Silver City during the month of June, states the *Southwest Sentinel*, amounted to $15,491 of gold; $1,184 silver; 115,300 lbs. of high grade sacked gold and silver ores; 442,600 lbs. of concentrates; 960,000 lbs. of lead ore, and 1,800,000 lbs. of iron ore. The amount of sacked ores is over 150% greater than for the preceding month. The lead shipments have more than doubled those of May, and quadrupled those of April. There is a decided increase in the amount of iron ore, and of concentrates. Owing to the building of the Silver City and Northern Railroad, no zinc ores have come in for shipment from the Hanover district. No copper bullion either was shipped from Silver City in June, on account of the closing down of the Neff smelter. This smelter is now in full blast again.

RESERVATION.—This mine, at Gold Hill, is said to be showing up well. The new air shaft has reached a depth of 100 ft., and drifting to connect with the old shaft is now in progress. The vein is from 10 to 20 in. wide, the ore assaying from $100 to $240 per ton.

TEEL & POE MINING COMPANY.—This company declared its first dividend, which was 1½% upon its capital stock ($150,000), in May last. Dividend No. 2, amounting to 2%, was declared in June. The company owns some of the best mines in the Cook's Peak district. An important strike was recently made in the Grand Central mine belonging to the company.

OHIO.

The strike of the 5,000 miners on the Cleveland, Loraine & Wheeling road and the Wheeling & Lake Erie extension to secure the nine-hour day was settled by a conference between the operators' and miners' representatives, and work was resumed on the 16th inst. The men accepted nine and a half hours to May 1 next and abandoned claims on deficiency work.

NATURAL GAS.

Evidence accumulates that the natural gas supply in Ohio is failing. It has long been known that the pressure in many of the older wells in the Findlay district has grown steadily less, while the greatly decreased pressure in the Columbus district last winter attracted wide attention. Now comes the announcement from Springfield and Dayton that the price of natural gas has been more than doubled, being placed above the maximum rate fixed in the charters of the company, which supplies the two cities. The best of testimony goes to show that the pressure in the Mercer County field, which supplies these cities and was the last Ohio district exploited, is about 40% less than when opened up. The advance in rates at this time of year, when the demand on the wells is the lightest, is considered particularly significant.

NORTHWESTERN NATURAL GAS COMPANY.—This company purchased the property of the Marion Natural Gas Company, thus obtaining possession of all the natural gas territory of northwestern Ohio, with the exception of that controlled by the municipalities of Toledo and Findlay. The Northwestern Natural Gas Company, of which Hon. Charles Foster is president, is controlled by the Standard Oil Company.

OREGON.

UMATILLA COUNTY.

IOWA MINING COMPANY.—This company has been organized at Pendleton by J. Sheurman, F.H. Kemper, Gus Stangier, Joe Basler and Andrew Larson. It will develop the Iowa mine, in the Greenhorn district. One of the ledges located is 15 ft. in width, and surface ore is said to assay $40 to the ton. It is the intention to tap it on a 400-ft. level by running a tunnel 500 ft in length.

PENNSYLVANIA.

COAL.

Messrs. O'Neil & Peterson, coal operators at Bunola, on the McKeesport & Bellevernon Railroad, are putting electric mining machines in their mines.

The new anthracite company operating at Mt. Carmel has completed arrangements for the reconstruction of the breaker recently demolished by a tornado.

Mine Inspectors H. McDonald, Pittston; Samuel Gay, Pottsville; Patrick Blewitt, Scranton; Wm. Stein, Shenandoah; John M. Lewis, Hazleton, and G. M. Williams, Wilkesbarre, and Mine Superintendent T. D. Jones, of Hazleton, held a meeting in Philadelphia last week. The merits of the Shaw machine were discussed.

Messrs. Geo. H. Myers & Co., operators of the Yorktown colliery, near Audenried, have been sinking a shaft for the past four months from the bottom of the old No. 1 workings. The shaft is now 250 ft. deeper than the old working. It is expected that the Buck Mountain vein will shortly be found.

The Philadelphia *Inquirer* of the 18th inst. prints the following: The announcement that a considerable tract of coal land in the vicinity of Minersville has been acquired by interests friendly to the Pennsylvania Railroad, and that this road will build a line to develop the property, means that the Pennsylvania Schuylkill Valley Road is to be made a profitable enterprise. It is expected that as much as 300,000 tons of coal annually will come from the new tract.

The following miners passed an examination recently held at Wilkesbarre, Pa., and have been granted mine foreman's certificates: Wilkesbarre, Enoch I. Jones; Plymouth, David D. Lewis, James Roberts, Thomas H. Picton, J. H. Evans, William D. Morris; Nanticoke, John Arnott; Larksville, Henry D. Hughes, A. Caswell; Alden, William F. Rees.. Up to date 96 additional certificates have been granted mine foremen who held certificates under the old act, and 135 certificates have been issued to assistant foremen.

According to a dispatch from Wilkesbarre on the 20th, there is absolutely no truth in the report telegraphed from that place to Pittsburg that a strike of the anthracite coal miners is possible, on account of the failure of the operators to comply with the recently enacted semi-monthly pay law. Up to the present there has been no demand made on the coal companies by the men, and it is not thought likely that there will be any, owing to the lack of organization in the anthracite regions. The rumors are said to have grown out of an interview with a coal operator, published in a local paper, to the effect that compliance with the new law would be extremely inconvenient to the employers. The utmost tranquillity exists among the miners at present.

The proposed reduction in the pay of the Monongahela River miners from 3½ cents to 3 cents per bushel is the topic of the day among the valley coal diggers. Meetings have been held by the men in several places and resolutions adopted to oppose the threatened move of the operators. The outlook is that the latter will precipitate a shutdown between August 1st and 15th unless the men agree to work at the reduced rate. This will be refused by the workers and another strike is likely. For the first time since last April, when the men won their fight for an increase of one-half cent per bushel, work was slack on the river last week. Many of the operators have begun to curtail production with the view, it is thought, to make favorable conditions for themselves when they shall wage their fight. It is estimated that the big lots of coal that have been shipped south, in addition to several million bushels now in the pools, will be sufficient to supply the market until next winter. The operators say that they cannot pay 3½ cents at present; that the prices on the Southern wharves do not warrant it. The miners take the ground that, should they agree to work for 3 cents during the summer months, the operators would force them to accept the same price next spring, the most prosperous season of the year; and that work will be slack on the river, at any rate, during the summer months, they argue, and they might as well make a fight on the matter now.

DELAWARE & HUDSON COAL COMPANY.—For several months operations at the Conyngham shaft of this company, in North Wilkesbarre, have been suspended because of an inundation of water, says the Wilkesbarre *Record*, and several hundred men have been thrown out of employment. A few months ago powerful machinery was put in place to pump out the water, and it was hoped that there would be an early resumption of work. A week ago the mine was cleared of the water, and the work of repairing was begun. On Sunday and Monday a number of explosions occurred, one of which caused a cessation of work in Baltimore No. 3. An experienced miner claims that the cause of these phenomena is extensive falls, producing concussions of air, which extend to Baltimore No. 3.

GLENWOOD COAL COMPANY.—This company, of Glen Campbell, is opening a new drift. In the near future the company will build a number of coke ovens. The Glen Campbell coal is now all shipped east.

JERMYN No. 1.—This colliery, at Rendham, Luzerne County, is idle owing to its flooding with water from an abandoned mine. A miner while at work in his chamber broke through a wall into the old workings, flooding 40 chambers. It will take a month or more to unwater the mine.

LANGCLIFFE COAL COMPANY.—S. Judson Stark, of Tunkhannock, and others have effected a lease whereby this company is to mine the coal underlying a 200-acre tract of their property lying between Avoca and Moosic, on the Lackawanna River, paying a royalty of 37½ cents per ton. The lease stipulates that the minimum annual royalty paid shall be $10,000.

MT. VERNON COAL COMPANY.—This company, through its agent, G. Mortimer Lewis, has purchased 300 acres of coal land in Winton Borough, formerly owned by the Peckville Coal Company. There is a breaker on the property having a 700 ton-a-day capacity. The breaker and mines have been idle for a number of years. Extensive improvements will be made and the property put in immediate operation. Mr. Lewis will be the general superintendent.

RAINEY BANKS COAL AND COKE COMPANY.—Construction on this company's works at Connellsville, known as the Elm Grove Works, is being pushed. The site is on the James Long farm, which includes 360 acres of coal which is now being opened.

YOUGHIOGHENY RIVER COAL COMPANY.—This company has entered suit against the West Newton Mines Company to recover $8,930 for 6,300 tons of coal alleged to have been mined by the defendants in 1890 from land owned by the plaintiff in Rostraver Township, Westmoreland County.

SOUTH CAROLINA.

BERKELEY COUNTY.

(From our Special Correspondent.)

The comptroller-general of the state has received the following returns from the auditor of this county regarding the operations of the phosphate companies of the county for the year ending June 30. Mount Holly Mining and Manufacturing Company, 16,176 tons; gross receipts, $48,528. Bradley Mines, 36,000 tons; gross receipts, $108,000. Charleston Mining and Manufacturing Company, 90,277 tons; gross receipts, $270,831. St. Andrews Mining Company, 22,714 tons; gross receipts, $68,142. Magnolia Phosphate Company, 33,000 tons; gross receipts, $99,000. Rose Phosphate Company, 13,790 tons; gross receipts, $41,370. Bolton Mines, 16,756 tons; gross receipts, $50,268.

INGLESIDE MINING AND MANUFACTURING COMPANY.—This company has been organized with a capital stock of $15,000, for the purpose of developing marl mines and building lime and cement works at Ingleside, on the South Carolina Railroad, about 14 miles from Charleston. The company's office is at Charleston; the officers are A. S. J. Perry, president; and J. D. Koster, secretary and treasurer.

DARLINGTON COUNTY.

(From our Special Correspondent.)

DARLINGTON PHOSPHATE COMPANY.—This company has been incorporated at Darlington with a capital stock of $70,000. Phosphate mines will be developed, and fertilizer works, acid chambers, etc., erected.

SOUTH DAKOTA.

CUSTER COUNTY.

AMBER.—The tunnel recently started on one of the claims of this group of claims, located about one and a half miles southeast of Custer, is being continued. An open cut of 50 ft. has been run, from which the tunnel has been extended a distance of 25 ft. It is expected that the vein will be tapped by extending the tunnel 50 ft. further. A number of assays have been made of ore found at the outcrop of the immense lode, the lowest of which is said to have been $19.41 and the highest $57.40 per ton.

BLUE BIRD.—The owners of this mine are pushing the development work. The shaft has reached a depth of over 30 ft., and will be sunk to the depth of 100 ft., when the vein will be explored by a cross cut from wall to wall, a distance of about 330 feet. The ore shows improvement as depth is attained, says the Custer *Chronicle*. Surface ore to a depth of 10 ft. assayed $5 per ton in gold and $2 in silver, while the ore at 20 ft. assayed $61.25 per ton.

TENNESSEE.

BLOUNT COUNTY.

(From our Special Correspondent.)

A syndicate of Boston capitalists is reported as having purchased a tract of 5,000 acres of land upon which is situated Montvale Springs. It is stated that a railroad, 12 miles long, connecting with the Knoxville Southern at McGhee, will be built, which will pass near large deposits of red and brown iron ores.

LAWRENCE COUNTY.

(From our Special Correspondent.)

FLORENCE MINERAL PAINT AND TRIPOLI COMPANY.—This company has been organized at Florence, Ala., with G. A. Leftwich, president, J. B. Bond, vice-president, and J. B. Leftwich, secretary and treasurer. The capital stock of the company is $25,000. The tripoli deposits of this county will be developed, and a mineral paint factory established at Florence, Ala. Work on the plant has been commenced.

TEXAS.

BEXAR COUNTY.

(From our Special Correspondent.)

SAN ANTONIO NATURAL GAS AND OIL COMPANY.—This company has been organized, with a capital stock of $2,000,000, to supply the city of San Antonio with natural gas for heating and illuminating purposes. The city has granted a very favorable charter for 30 years. The company owns seven wells from 300 ft. to 1,200 ft. in depth, with a gas pressure of from 50 lbs. to 200 lbs. per sq. in. The company also has two oil wells in operation, from whose product is produced a high grade lubricating oil which is indorsed by the Southern Pacific Railroad Company.

HARDEMAN COUNTY.

(From our Special Correspondent.)

LONE STAR CEMENT WORKS.—Prescott & Daw, of Salina, Kan., have organized this company for the purpose of manufacturing adamant plaster, kalsomine, plaster of paris, etc. The works will be located at Quanah. Their daily capacity will be 800 barrels of adamant plaster, and other products in proportion.

UTAH.

BEAVER COUNTY.

HORN SILVER MINING COMPANY.—The official report for the quarter ending June 30 is as follows: Sales of ore, $108,492; miscellaneous, $7,778; balance last quarter, $274,908; total receipts, $391,178; mining expenses, $41,893; general expenses, $6,165; dividends, $50,000; cash balance, $293,120; total disbursements, $391,178.

PIUTE COUNTY.

DALTON GOLD MINING AND MILLING COMPANY.—A cross-cut at the face of the 100-foot tunnel in the Hard Cash mine has proved an ore body 15 feet in width, the ore being of similar character to that opened in the Pearl mine. At present a force of 30 men is engaged upon development work.

TOOELE COUNTY.

HONERINE MINING COMPANY.—No work has been done in this mine for the past month. The concentrating mill is running on Legal Tender ore.

UINTAH COUNTY.

Two miners who have recently come in from Uintah County express themselves as having little faith in its richness as a mining section, says the Salt Lake *Times*. The formation, which is nearly all a limestone, lies very flat and is seldom broken by any of the eruptive rocks, something which miners look upon as being almost essential to the making of ore in limestone. There are small veins of ore scattered through the country for miles, but they give little hope of becoming valuable with development. The district has been well prospected for two years past, but the work has shown up nothing of great promise. In the Dyer mine there is at times as much as 2 ft. of good copper ore, but it is unreliable and may play out in a foot. The Bassett is the best of the silver-lead properties. It is a true fissure vein in the limestone about 2½ ft. wide. The best ore it produces runs from 4 to 15 oz. in silver and 79% lead.

UTAH COUNTY.

The color of the slate, recently opened at Provo, is green; it weighs about 170 lbs. per cu. ft., and has a crushing strength of 20,000 lbs. per cu. ft. An analysis shows it to have the following composition: Silica, 60·50%; alumina, 19·70%; iron (protoxide), 7·83%; lime, 1·12%; magnesia, 2·20%; potash, 3·18%; soda, 2·20%; water, 3·27%.

WASHINGTON COUNTY.

DIXIE MINING COMPANY.—During June this company shipped 60 tons of ore assaying 52% copper and from 4 to 6 oz. silver per ton.

VIRGINIA.

ALLEGHANY COUNTY.

(From our Special Correspondent.)

CRAIG VALLEY MINING COMPANY.—This company has been organized at Covington with a capital stock of $100,000, to develop iron mines in Craig Valley of this county. Messrs. McElwains and Fontleroy, of Lynchburg, are respectively president and secretary.

FLUVANNA COUNTY.

(From our Special Correspondent.)

COLUMBIA MINING AND LAND COMPANY.—This company has been organized with a capital stock of $250,000. It owns about 2,500 acres of lands in and near Columbia, of which 1,500 acres are mineral lands. It is proposed to develop the mineral resources, lay off building lots and otherwise improve the town of Columbia. The officers are: A. W. McAllister, of Greensboro, N. C., president; B. R. Cowherd, vice-president, and M. W. Foster, secretary.

GOOCHLAND COUNTY.

(From our Special Correspondent.)

MANNING.—Messrs. G. H. Manning and G. A. Bishop, owners of this gold mine, report a very favorable outlook. Considerable development work in the way of sinking has recently been done, as a result of which negotiations are being made with the Mecklenburg Iron Works, of Charlotte, N. C., for an increase of plant. The ore is free milling quartz of fair grade, satisfactory tests of which have been made with a Fraser & Chalmers three stamp prospecting mill. The mine is situated about 8 miles from the town of Columbia, on the James River Division of the Chesapeake & Ohio Railroad.

WASHINGTON.

KING COUNTY.

The miners of the Black Diamond coal mines, Seattle, have conceded the right to the company to hire and discharge men, and 150 miners have signed the contract. The Newcastle miners are now in charge of deputy sheriffs. Everything is quiet, however, and it is thought will remain so until the evictions begin, when trouble is expected. All of the militia called out has been ordered home.

KITTITASS COUNTY.

A late dispatch says that great excitement prevails over gold finds in Menatash Cañon, 15 miles from Ellensburg. It is alleged that nuggets and dust are found daily and that the gold is of fine quality. Several silver ledges are also said to have been discovered in the cañon, and gold has been found in the hills north of Ellensburg. Many prospectors are starting for the fields.

OKANOGAN COUNTY.

FOURTH OF JULY MINING COMPANY.—An adjourned meeting of the stockholders of this company was held in Helena, Mont., on the 15th inst. The mines are located in Okanogan district. The following trustees were elected for the ensuing year: J. K. Clark, Louis G. Phelps, Major G. O. Eaton, E. Zimmerman, Louis Teuscher, A. J. Seligman and Charles Kaufman. At a subsequent meeting of the trustees J. K. Clark, of Butte, was appointed president, A. J. Seligman vice-president, G. M. Hedderich secretary and L. G. Phelps, treasurer.

STEVENS COUNTY.

CONSOLIDATED BONANZA MINING AND SMELTING COMPANY.—This company has been incorporated, with a capital stock of $1,000,000; shares $1 each. One-half of the capital is 6% preferred stock. The principal place of business of the corporation will be in Spokane. The incorporators own five-eighths of the Bonanza mine, seven miles from Marcus. The purpose of the company is to smelt its own ores and ores from other claims which it can buy. A smelter will be built at some convenient point near the Marcus on the Spokane & Northern R. R. The trustees managing the affairs of the corporation are: Samuel Ansler, Charles H. Armstrong, John M. Seders, William A. Myrick, Charles P. Ouden, of Spokane, and Howard E. Walters and Henry Remington, of Ellensburg.

WEST VIRGINIA.

TAYLOR COUNTY.

Paul B. Sleet, a prominent coal operator in the Mercer County coalfields, has purchased a large body of coal land in this county, and will open mines near Grafton, on the line of the Baltimore & Ohio Railroad. The new mines will be run entirely with electrical machinery. The product will be offered in the Chicago market.

TUCKER COUNTY.

DAVIS COAL AND COKE COMPANY.—This company has put in a new tipple at its works at Coketon. It contains 60,000 ft. of lumber. Another tipple, requiring 200,000 ft., is being built for Senator Gorman and others at Tucker.

FAYETTE COUNTY.

(From our Special Correspondent.)

GAULEY MOUNTAIN COAL COMPANY.—This company has 100 new coke ovens in course of construction. Other improvements in its plant are to be made, among which are a new locomotive boiler and fixtures for the mine fan. The address of the company is Ansted.

LOGAN COUNTY.

(From our Special Correspondent.)

It is reported that the West Virginia Central & Pittsburg Railroad Company, of Cumberland, Md., has purchased a large tract of land in this county, and will establish a town, erect blast furnaces, iron works, etc.

WEBSTER COUNTY.

(From our Special Correspondent.)

John L. Thornhill, of Charleston, W. Va., has sold to a syndicate of Eastern capitalists a tract of land comprising 4,824 acres, for which the sum of $50,000 was paid. The land is situated on Elk River, covered with virgin forest, and is traversed by two good veins of coal. The West Virginia Central & Pittsburg Railroad runs through the property.

WYOMING.

CARBON COUNTY.

A large ledge of copper ore is reported to have been discovered near Battle Lake on Pass Creek. The lake is 43 miles from Fort Fred Steele, and 20 miles from Saratoga.

Reports from the Gold Hill country are that the roads are now in good condition, and that teams are going in every day. Many new discoveries of gold quartz are said to have been made this season, but the development of the quartz mines is slow for lack of machinery. There is considerable excitement over the placer ground on North Basin Creek, about 6 miles from Gold Hill camp. The gravel has been found so far to be 57 ft. deep, and the bottom not yet reached, the material prospecting well the whole way down.

SWEETWATER COUNTY.

UNION PACIFIC COAL COMPANY.—No. 4 mine is getting back to its old record again, says the Rock Springs *Independent*, and on one day recently there was hoisted 1,118 tons—the largest amount since the fire. No. 4 coal is mined entirely by machinery and 16 mining machines are now kept at work. Four more machine runners have been sent for, so that 10 machines will soon be at work in the coal bank.

FOREIGN MINING NEWS.

BRITISH COLUMBIA.

(From our Special Correspondent).

WEST KOOTANIE DIVISION.

NELSON, July 12.

The railroad from Sproat to Nelson having been completed, the mine owners of this district are now in a position to ship ores to Revelstoke or United States smelters at reasonable rates. The freight on ore, not worth more than $100 per ton, from Nelson to Revelstoke has been fixed at $6 per ton, to Great Falls, Mont., at $14.50, and to Tacoma at $11.50. Let the import duty on lead ore be repealed and smelters of the United States will receive considerable shipments from this section.

Good progress has been made on the wagon-road from Nelson to the Toad Mountain claims, and another three weeks will see the road completed to the Silver King property. The work is being done by day labor, the lowest tender sent in being $19,000.

The new gold commissioner for this division, N. Fitzstubbs, has been in Nelson for some weeks and proposes to make it his headquarters.

HOT SPRINGS DISTRICT.

DELLA.—This claim, supposed to be on the northern continuation of the Number One deposit, was recently jumped by R. Jackson on the grounds that the stakes were not of the legal size (at least 4 ft high by 4 ins. square) and that the recent assessment work had not been done within the boundaries of the claim. The case will be heard before Justice Walkem at the next County Court.

DICTATOR.—A station is being put in preparatory to sinking on the ore encountered at the end of the north tunnel. Sinking will also be continued on the ore in the incline at the south end of the claim. The ore body is 2½ ft. wide and often contains native silver.

GLENGARRY.—A 60-days working bond has been secured on this promising property by Richard Ashworth, of Billings, Mont. The price is $6,000.

OLD TIMER.—Richard Ashworth recently purchased this claim for $2,000 cash.

REVELSTOKE MINING COMPANY.—This company, owning the Number One, United and other claims, states that it is its intention to blow in its smelter at once, and to ship the ore lying on the Number One and United dumps for treatment at Revelstoke. There is a report abroad, however, that the ore is to be sent to Great Falls. The news from the Number One mine is to the effect that there is from 2 to 3½ ft. of ore, and that the ore body has straitened considerably.

NELSON DISTRICT.

OLLIE.—A. M. Esler, of Gem, Idaho, has purchased a one half interest in this claim for $10,000—$1,200 cash down—from E. S. Topping, and also A. H. Kelly's bond on the other half interest for the same amount. A little ore has been found on the Ollie, but the ground is also needed for the better development of the Dandy.

QUEEN VICTORIA.—This low-grade copper-silver-nickel property, on the north side of the Kootenay River, has recently been visited by some mining men from Sudbury, Ont. They were favorably impressed with the property, and were of opinion that the ore occurred under the same conditions as in the Sudbury district. There is more mineral in the face of the tunnel than I have seen on any previous visit.

SILVER KING.—A thorough examination of the Kootenay Bonanza Mining Company's property, including the Silver King mine, has been made by Mr. Parkes, mining expert, of Helena, for Franklin Farrel and A. B. Hendryx of Connecticut, and it is probable that these latter gentlemen will secure the property, if the question of price can be agreed upon. Mr. Farrel is the president of the Parrot Company, Butte City, while Mr. Hendryx is largely interested in the Blue Bell mine, in the Ainsworth camp.

WHITEWATER.—The new Huntington mill has been started upon some low-grade rock, and, judging from the tailings, is doing very satisfactory work. The appearance of the mine is still satisfactory.

WILD CAT.—The contract for an additional 50 ft. of tunneling has been completed, but nothing new has been developed, owing in a measure to the absurd "course" followed in the new work, which has been run practically parallel to and within a few feet of the former tunnel. The recent trial-run of Wild Cat ore is reported to have yielded $16.12 per ton.

CANADA.

PROVINCE OF MANITOBA.

The Canadian Pacific Railway, in return for a bonus of £30,000 from the provincial government, has undertaken to build tracks to the coal fields of the Souris district; another company has given a £10,000 bond that it will develop the mines; the two companies jointly guarantee that the coal now selling at 30s. a ton throughout the province will be supplied to Winnipeg at 16s., Brandon at 14s., and southern points at much less, the coal being supplied on the cars at 7s. a ton. From £10,000 to £15,000 will be spent on the mines this year, so as to be ready for the opening of the railway.

PROVINCE OF NOVA SCOTIA.

Negotiations are pending for the transfer of the Ontario Colliery, Cape Breton, to American capitalists, states the Stellarton *Journal*. Comparatively little coal has been taken from this mine as yet. Shipments are now being made from Big Glace Bay, but not on a large scale.

PROVINCE OF ONTARIO.

Messrs. Parsons, of Painpoonge, and Barrie and Woodside, of Port Arthur, who patented lot 19, second concession of Paipoonge, last fall, have located on their property two veins running east and west, one 8 ft. wide and the other between 2 and 3 ft. The large vein has been traced about 300 ft. The strike of the veins indicates that they unite. One hundred and fifty feet is uncovered along the outcrop of each vein, showing ore rich in native silver. The owners are said to have refused two offers of respectively $80,000 and $100,000 for the mine.

ENGLAND.

A rich vein of iron ore, 20 ft. thick, was discovered in sinking a well at a depth of 150 ft., on Lord De Ramsey's estate at Abbott's Ripton, Huntingdonshire. A syndicate has been organized to open the new bed.

A London dispatch states that fire in the West Stanley colliery at Consett, near Durham, on the 13th inst., wrecked the pit head and destroyed most of the machinery. The loss, it is said, will exceed $300,000. About 5,000 men are thrown out of work.

GREECE.

Rich petroleum deposits have been discovered on the Island of Zante, Greece, according to a cable dispatch from London.

MEXICO.

HIDALGO SMELTING AND REFINING COMPANY.—This company, which has its headquarters at Sultepec, has been building extensive works at Sultepec which have been under construction for the past two years and have only recently been finished, says *El Minero Mexicano*. The company is composed of capitalists of Milwaukee, Wisconsin, with Col. H. D. Mackay as General Manager and Mr. M. A. Jackson as Manager of the mines at Temascaltepec. The capacity of the Sultepec works is 200 tons of ore per day. The power is derived from the river, which has its source beyond Sultepec and empties in the Balsa River. The wheel is a Leffel turbine and develops 120 horse power. Col. Mackay states that about 100 men are employed at Sultepec in the mines, and an increase of the force is contemplated at an early date. The company will soon begin to use a mixture of coke and charcoal in its furnaces instead of charcoal alone as now. The coke will be imported from the United States over the Mexican National Railroad. The works are 35 miles from Toluca, with a good mule road running to the latter city, over which all of the machinery was transported from the railroad. Col. Mackay has just closed a deal for the purchase of the control of eight mines near Temascaltepec, and is arranging to buy ores all over the country.

CHIHUAHUA.

NORTH MEXICAN MINING AND MILLING COMPANY, LIMITED.—At the second general meeting of the shareholders of this company, held in London on the 6th inst., a report for the preceding year was submitted by the directors. The company entered into a contract in October, 1890, to reduce 20,000 tons of ore. The mill was not put in operation until the beginning of January, there having been unavoidable delay. The financial condition of the company made it necessary for the management to act with great caution, and it was consequently decided to discontinue exploration of the San Nicholas mine until the profits from the mine should be sufficient to carry on that work. Up to the end of May the company had milled ore yielding $72,209.35 at a cost of $37,445.16, one-half of the profit, or $17,382, being the share of the company, according to the contract. The stamping capacity of the mill is 175 tons per week, and the roasting capacity but 130 tons. New furnaces and lixiviating tanks are now in course of construction which will increase the capacity of the mill 10 tons per day. La Gloria mine, belonging to the company, is opened by a tunnel 550 ft. into the mountain, which has exposed a consider-

able body of ore. Since February 300 tons of this ore, averaging 90 ozs. silver per ton, have been shipped. This ore is oxidized, and worked alone in the leaching mill yields but 46% of its value. Mixed with sulphuret ore from 85% to 90% has been extracted. The company is now endeavoring to secure supply of sulphuret ore from an adjoining mine, when it is estimated that La Gloria ore can be treated at a saving of $30 per ton. The shaft on the San Nicholas lode has been sunk to the 400 level where the vein bulges, and prospects are considered excellent. Mr. Ottokar Hofmann, mining engineer, manager of the company, is highly complimented for his work at the mine and mill.

BUILDING MATERIAL MARKET.

NEW YORK, Friday Evening, July 24.

Building operations on those structures started some time ago are progressing with hardly a drawback. A few new buildings are being started, but the belief prevails that there will not be a very extensive movement in this direction until the fall months.

Lumber.—The St. John strike is still on. We hear a report that negotiations for a settlement are being conducted, and it is thought that a resumption of operations will take place before many weeks. There is a considerable amount of lumber coming forward from this district, it being from stock piles. Notwithstanding the price of spruce has risen $1 to $14@$16, there is a dearth of lath in the market, caused by light stocks and the fact that a large number of buildings have reached their "lathing period" at one time. The price is very strong at $2.25@$2.30, and even more is paid.

Brick.—There is to be noted a moderate activity. Arrivals during the week have been 15,000,000. A similar amount has gone into consumption, leaving a surplus of about 2,500,000 in stock. Kilns continue in full operation. Prices are: Up Rivers, $4.25@$4.75; Haverstraws, $4.75@$5 25.

Lime.—The situation from the burners' standpoint continues to strengthen. There is no lime in the market, and very little in second hands; stocks are light and little on the road. The burners continue to close down. There is now a well-defined movement to starve the market, and it looks as if it would meet with success. The quotation is $1 strong.

Cement remains unchanged at 90c@$1.

CHEMICALS AND MINERALS.

New York, Friday Evening, July 23.

Heavy Chemicals.—The week under review, judged from a midsummer standpoint, has been fairly active. There seems to be manifest a progressive movement which it is believed will consummate in a good fall trade. Stocks, with few exceptions, are being kept at a minimum, and conditions generally are ripe to respond to any stimulus which may be exerted on the market. Again we hear much talk to the effect that the Alkali Union is likely to show its hand in marking up prices. There is nothing definite on this point, however.

Carbonated Soda Ash.—Several good-sized spot sales were made last week to glass manufacturers, at 1·50@1·60c. Reports of the possibility of an advance by the Alkali Union has caused a number of inquiries.

Caustic Soda.—Stocks continue light. 60%: There had been several arrivals, all of which have gone into consumption. Sales for July and August shipment continue at 3·25@3·32½c. 70-74%: Stocks are light, notwithstanding a number of arrivals. Sales for spot and futures had, comparatively speaking, been considerable, at 3·05@3·10c. 77%: Stocks which were reported light last week have been exhausted, and the spot business is next to nothing. Transactions in futures have taken place to the extent of several hundred drums, at 3·05@3·10c.

Caustic Soda Ash.—Light arrivals relieved the somewhat straightened market of last week. Stock continues light. The demand is not great. We quote 1·60@1·70c.

Alkali, 48%: The demand which last week was almost nothing has improved in marked manner during the period under review, both for spot and futures. This is especially true of contracts, and it looks as if buyers were utilizing the opportunity afforded to acquire stocks before an advance can be made. We repeat our quotations of 1·55c.@1·30c. for B. M. High test B. M. is in light stock. Recent arrivals have gone into consumption. 1·42½@1·45c. is quoted.

Sal Soda.—Stocks continue very light and buyers are contenting themselves with futures at 1·07@1·12½c. The demand is good and prices are stiff.

Bleaching Powder.—There is plenty of stock, some of which is pressing for sale. The transactions consist of a jobbing trade at 1.75@1.85c.

Acid.—Continued activity characterizes this market. Almost all manufacturers report a good business and one which promises to continue through the fall.

There has been no change in prices. Sulphuric is meeting with an unusually brisk demand, and it is the belief that it will be a scarce commodity during September and October. Already the manufacturers are having all they can comfortably do to supply customers. Renewed activity, which will prevail in the fall among phosphate and other consumers, will soon be felt. We repeat quotations:

Acid per 100 lbs. in New York and vicinity: Acetic, $1·65@1·75c.; alum, $1·55@1·75c.; muriatic, 18°, 80c.@$1; muriatic, 20°, 90c.@$1.10; muriatic, 22°, $1@$1.20; nitric, 40°, is selling for $4.50, and from that upward according to quality, etc.; nitric, 42°, $5@$6; oxalic, 7¼@7½c.; sulphuric, 60°, 75c@1; sulphuric, 66°, 85c.@$1; tartaric, 33@34c.

Brimstone.—The market has weakened considerably since our last report, and notwithstanding cable advices it is the opinion that its immediate future will be still weaker. Early in the week a spot call was made at $26. Later it was quoted at $25 with sales of 200 tons. Stock is light. Futures are quoted at $24 for seconds and $23.25 for thirds.

Fertilizers.—Business in futures is looking up in anticipation of the fall trade. The demand for ammoniates for the future is good.

Sulphate of ammonia is firmer owing to sales of surplus stocks and more general inquiry; 3·05@3·10c. is quoted. Bone sulphate is a trifle stronger than last reported, at 3·02½@3·05c. Dried blood is in better demand at 1·95@2c. Tankage is quiet at $19@$21.

Azotine is receiving some inquiry at 1·95c. Bone meal is quiet at $22.50@$23.50; raw, $24@$28.

Fish scrap continues in good demand at $21.50@$22.50. The same is true of wet acidulated fish scrap at $11.50.

Double Manure Salts.—There is a small business. We quote the syndicate price of 1·10@1·12½c. for 48%. For 90% to 95% basis, 90% foreign invoice, weights and lists, 2·07½@2·10c. Lots under 50 tons proportionately higher.

Kainit is well sold up. There is little demand, and no arrivals. Quotations, $8.75@$9.75. For Southern ports, $1 additional.

South Carolina phosphate rock is unchanged. We quote for land rock $7@$8, wet and dry respectively, f. o. b. vessels at mines, and $7.25@$8.25 f. o. b. cars. There is but little high-grade river rock in the market. Low grades taken from marshes are selling at about $7.25.

Florida phosphate rock is coming into the market in moderate quantities. We quote $7.50 per ton f. o. b. vessels Charlotte harbor. We are indebted to the Knudson & Paterson Company, selling agents of the Place River Phosphate Company, for the following table of shipments of this rock for the year 1890 and for the six months ending June 30th. The amounts are given in tons of 2,240 pounds:

RIVER ROCK.	0.	1891.
From Place River to Europe	5,750	10,220
" " " United States ports.	6,900	6,525
" " " inland points by rail (estimated)	.....	5,000
Place River, total	11,750	21,745
From Black River to Europe	1,480	....
" " " United States ports.	1,225	600
Black River, total	2,705	600
WHITE LAND ROCK.		
From Fernandina to Europe	7,683	16,373
" Tampa " "	700	7,475
" Brunswick " "	....	780
" Savannah " "	782	263
Shipments inland by rail (estimated)	1,748	3,000
Total, land rock	10,913	27,891
Total production	25,368	50,236

We understand that a deal has recently been consummated which involves the transfer of 460 acres of choice mineral phospoate lands in Buckingham, Canada, now being worked to a company which proposes to put up a plant under a guarantee that it will produce acid at $7.30 per ton, 50° Baumé, with which to manufacture superphosphates acid. The concern is a "going" one, and the goods will be in the market in a short time.

Muriate of Potash.—Trade is dull and consists of the usual jobbing demand. Arrivals, 200 tons on the 17th inst. Sales for the week, 150 tons.

Blue Vitriol.—Transactions continue in considerable volume at the low figure of 3¼@3½c. We failed, after an investigation, to find anything tangible in the report that manufacturers are moving toward the formation of another combination. It is estimated that one pound of copper makes three pounds of blue vitriol. At about 11c. for copper and 1½c. the cost of converting it into vitriol, there can be no profit in the product at the present ruling figures.

Nitrate of Soda.—The market continues to lose ground. The arrival during the week consisted of 1,300 bags, all of which went into consumption. In addition to this 2,000 bags were sold at 1⅞c. The price for future delivery is quoted at 1·75c. Arrivals between now and September will be light.

Liverpool. July 15.

(Special Correspondence of Jos. P. Brunner & Co.)

There is little change in the position of heavy chemicals, but a rather better inquiry is reported in some lines for forward delivery.

Soda Ash.—The Union reports a fair business in Carb. Ash, and this is rather firmer than was the case a short time ago. It was rumored recently that the Union had in some cases shaded its quotations, but it now states that it will take nothing less than the full market prices, which we quote as follows: Caustic Ash, 48%, £5. 2s. 6d. per ton; 58%, £6 4s. per ton. Carb. Ash, 48%, £5 7s. 6d. per ton; 58%, £6 10s. per ton, all net cash. For some special brands a premium on these figures is demanded.

Soda Crystals are quiet at £3 5s. to $3. 7s. 6d. per ton net cash.

Caustic Soda is neglected, but holders decline to make any concession on quotations, which are as follows: 60%, £9 10s. to £9 15s.; 70%, £10 15s. to £11 per ton; 74%, £11 15s. to £12; 76%, £13 to £13 5s. per ton, all net cash.

Bleaching Powder is in better request, there having been a fair number of inquiries from your side for forward delivery. The Union, however, declines to quote beyond July delivery, although it might possibly accept orders for July and August, but it has declined business to the end of the year at £7. The spot quotation remains at £7 per ton net cash, but it is expected that ere long this price will be advanced, and it is probably on this account that orders to the end of the year have been refused.

Chlorate of Potash steady at 5⅝d. per pound less 5%, but there is little business passing.

MINING STOCKS.

[For complete quotations of shares listed in New York, Boston, San Francisco, Baltimore, Denver, Kansas City, Birmingham, Ala., Pittsburg, St. Louis, London, and Paris, see pages 115 and 116.

NEW YORK, Friday Evening, July 24.

A weekly chronicle of the state of the mining market involves a wearisome repetition of unbroken quiet. It has not fallen to our lot to report an exception, in the way of a week of activity, for many months past, and unless Providence, or something else, interferes, there is little probability of a change in that direction. A man may become accustomed to anything—even to dullness. Our brokers, who were wont to display impatience at the persistent lethargy of the market, now wear an air of resignation truly pathetic. They have ceased to hope for a speedy resumption of old-time briskness, and they seem but little inclined to put forth any considerable amount of exertion to better the existing condtion of things. Apparently they have determined to let the future bring the much-desired change without any assistance from them.

Consolidated California & Virginia, which closed last week at $5.88, opened at $5.25 and sold at $6.13 at the close, with dealings amounting to 200 shares. Belcher had a solitary sale at $1.40; Crown Point was quiet at $1.05@$1.25; Gould & Curry was lightly traded in and advanced from $1.25 to $1.70; Hale & Norcross was quiet at $1.70@$1.85: Ophir, which opened at $2.75, advanced to $3.65, and Savage from $1.25 to $1.65.

Sierra Nevada shows sales of 200 shares at $1.95@$2.30; Yellow Jacket at $1.60@$1.80 disposed of 495 shares. Alta was very quiet at 70c.@75c. Best & Belcher fluctuated between $2 and $2.17; Chollar was dealt in to the extent of 500 shares, advancing from $1.14 to $2.15.

There was some demand for Mexican at $1.70@$2.30; Potosi advanced from $3.90@$4.50; Union Consolidated from $1.90@2.10; Scorpion has one sale at 30c. Utah was stationary at 75c. There were 6,300 shares of Comstock Tunnel sold at 16@18c.

Of the Tuscaroras, Nevada Queen was dealt in at 28@30c., the sales aggregating 700 shares.

Of Alice, 1,000 shares were sold at $1.70@$1.75; Mutual Smelting and Mining has one sale at 95c.

The California stocks show the largest transactions in number of shares. Of Astoria, 9,500 shares were sold at 1c. Belmont shows sales of 1,700 shares at 77@79c.; Brunswick, at 9@10c., disposed of 3,400 shares. Emmett was stationary at 70c., with transactions aggregating 800 shares. Plymouth had no sales this week. The last financial statement of this company is to be found in our mining news column.

Of the Utah stocks, Ontario appeared in some demand at $39.38@$39.75. There was no trading in Horn Silver. The financial statement of this company for the quarter ending June 30th will be found in our mining news column.

The Black Hills stocks were quiet. One hundred shares of Deadwood Terra were sold at $1.25, and Caledonia, at 65c., disposed of an equal number of shares.

The only Colorado stock showing sales during the week is Leadville Consolidated, 100 shares at 11c.

Boston. July 23.

(From our Special Correspondent.)

The lower quotations for copper in London have had a depressing influence upon the market for copper stocks which is most marked in the dividend paying mines. The market is very narrow and sales are chiefly in small lots, showing a desire on the part of investors to go slowly in making purchases; the general public is doing nothing in the way of speculation. The result is a dull and stupid market with no present prospects for a better.

Calumet & Hecla declined from $257 to $250, at which price considerable long stock came out. Tamarack sold up to $154 early in the week, but declined in sympathy with Calumet & Hecla to $150, which seems to be bottom price. A small lot of Quincy sold at $107, with later sales at $110. A dividend of $5 per share was announced to-day, making $10 for the past year. This is the largest

dividend paid in any one year since 1882, when $13 was paid.

The Montana stocks have been only moderately active at lower prices. Boston & Montana sold ex-dividend at $42 to-day, against $45¾ dividend on early in the week, a net loss of $2¾ per share. Butte & Boston declined to $14½, a loss of $1 per share for the week.

Centennial also declined from $15 to $14½, notwithstanding the favorable reports from the mine.

Franklin has been fairly steady at $16½, but Huron declined to $1.

Kearsarge sold at $12, and Atlantic declined from $16½ to $16.

Osceola has been very quiet, selling down to $36½, which is about $1 per share less than last week. Allouez sold quite freely at $2¼, at which price it seems to find ready purchasers. The rumors of an assessment in the near future are authoritatively denied. The stamp mill is again at work, a heavy rain furnishing the necessary power. Arnold sold at 80@85c.; Santa Fe at 45c. A small lot of Central sold this week at $18, the first quotation for many months.

The silver stocks are very quiet. No one seems inclined to buy them and they are hard to sell. Napa sold at $4. Dunkin is offered at 55c., Breece at 32c., Catalpa at 22½c. and Crescent at 15c.

3 P. M. The only change to note this afternoon is the decline in Tamarack to $147½ for 10 shares.

By Telegraph.—Calumet & Hecla, $250 bid; Tamarack, $146 bid; Osceola, $36 bid; Franklin, $15¾ bid; Atlantic, $16 bid; Centennial, $14¼ bid; Butte & Boston, $14⅜ bid; Boston & Montana, $42 bid; Allouez, $2¼.

Denver.

Prices and sales for the week ending July 18th, 1891:

Company	Opening.	H.	L.	Closing. Bid.	Sales.
Mines.					
Alleghany	10a	....	....	12	.....
Amity	02½	03	02½	02½	9,300
Bangkok-C.-B	06½b	07	06¼	06¾	700
Bates-Hunter	70a	69	69	67	100
Brownlow	05¼b	05	05	04	100
Calliope	16½b	20	20	17½	3,000
Cash	15b	....	....	20	.....
Clay County	120a	118	116	115	1,300
Gettysburg	14b	15	15	15	100
Gold Rock	57b	*64	57	60	7,400
Leavenworth	11½b	10½	10	09	200
Little Rule	110a	....	....	†110	.....
Matchless	290b	....	....	300	.....
May-Mazeppa	125a	125	123	123	1,100
Oro	100b	....	....	100	.....
Pay Rock	02b	....	....	....	.....
Puzzler	04¼b	03¾	02¼	....	3,900
Reed National	70a	....	....	61	.....
Rialto	....	109	105	109	1,800
Running Lode	22¾b	23	22¾	20	300
Whale	27½b	32	32	31	600
Bal. Smuggler Prospects.	53b	....	....	54	.....
Argonaut	10b	....	....	10¼	.....
Big Indian	08b	....	....	†10	.....
Big Six	08b	....	....	07	.....
Century	43a	40	40	35	100
Claudia J	08¼b	08½	07¾	07½	1,000
Nat. G. & Oil Co	09	*11½	08	11¼	51,000
Diamond B	03¾	04	03¼	03½	30,100
Emmons	45b	*47½	45	*47½	12,300
Golden Treas	32b	†37	32	31½	8,200
Ironclad	02¼b	*03	02½	02¼	4,600
John Jay	04¼b	04¼	04	04	200
Justice	12½	13	12½	12¾	3,000
Legal Tender	02¼b	*02¾	02¼	02¼	2,800
Morning Glim	45a	....	....	....	.....
Park Consolidated	10½b	11	11	10	100
Potosi	‡05½	05¾	05	05¼	8,700
Total					152,000

* Buyer 30. † Buyer 60. ‡ Seller 60. § Seller 30.
a Asked. b Bid.

San Francisco. July 16.

(From our Special Correspondent.)

The Comstock market has been going from bad to worse during the week, and brokers are calling on their customers for more money to bolster up shaky margins. Consolidated California & Virginia sold at $5 to-day, despite the fact that the 50-cent dividend is payable to-morrow. The street is wondering how low it will go after the dividend is deducted. It is currently reported that the mine developments have been disappointing.

The Bonanza stock, has not been the only one, however, to give way. Rumors of further assessments have had a depressing influence on the entire line of Comstock shares. Ophir has sold as low as $2.50; Mexican, $1.55; Sierra Nevada, $1.95, and Union, $1.75.

Best & Belcher sold freely at $1.65, and Challar was fairly active at $1.35; Hale & Norcoss was firm at $1.55; Potosi at $3.05, and Savage at $1.05, with but moderate sales.

In the Gold Hill group trading was more brisk. Bullion was in demand albeit it sold from $2.60 down to $2.20; Crown Point ruled at 90c. and Overman at $1.85.

Of the outside stocks the Tuscaroras have been the only ones meeting with any sale whatever, and they at very low rates. Belle Isle has sold steadily at 40 cents, and North Commonwealth at 45 cents, with small transactions.

Judging from the present appearance of the market it would seem as if another period of stagnation was about to depress it. On the other hand, rumors, some of which are not without authority, are to the effect that very shortly there will be a reaction, the market will show more strength, and a healthier tone pervade Pine street.

Lake Superior Iron, Gold and Silver Stocks

(Special Report by A. M. Helmer, Milwaukee, Wis.)

Iron.	
GOGEBIC RANGE:	
Anvil	$3.50
Ashland	51.00
Aurora	9.50
Bessemer Consolidated Bonds	20%
Brotherton	2.50
Cary	....
Colby	....
Father Hennepin	....
Germania	9.00
Gogebic Iron Syndicate	.25
Iron Belt	1.50
Metropolitan Land and Iron Co	60.00
Montreal	10.50
North Pabst	2.25
Northern Chief	30.00
Odanah	13.50
Pabst	....
Palm	1.75
Pence	1.50
Penokee and Gogebic Developm Co	....
Ruby	....
Ryan	.55
Section 33	13.50
Windsor	....
Wisconsin Iron and Steel Co	.60
MARQUETTE RANGE:	
American	$2.25
Champion	78.00
Cleveland	16.50
Cleveland Cliff Iron Co	....
East New York	2.00
Humboldt	....
Iron Cliffs	....
Jackson	104.00
Lake Superior	56.00
MARQUETTE RANGE:	
Michigamme	....
Milwaukee Iron Co.	$5.00
Negaunee	....
Pittsburg and Lake Angeline	142.00
Republic	30.00
Riverside	2.00
MENOMINEE RANGE:	
Aragon	....
Chapin	....
Commonwealth	10.50
Florence	....
Hamilton Ore Co	....
Lincoln	2.00
Mansfield	....
Mastodon	....
Metropolitan	60.00
Monitor	....
Norway	....
Paint River	....
Pewabic	....
Quinnesec	....
Sheldon and Shafer	....
Sheridan	5.00
Vulcan	....
Youngstown	....
VERMILION RANGE:	
Chandler	37.00
Chicago and Minnesota Ore Co	100.00
Clingstone	.25
Inter-Ocean	.25
Minnesota Ore Co.	71.00
Northwestern	.25
Pioneer	....
Vermilion	.25
Vermilion P. & L. Co	2 25
Gold and Silver.	
Badger Silver Mining Co	3.00
Michigan Gold Co.	.30
Peninsula Gold Mining Co	....
Ropes Gold and Silver Co.	1.75

Salt Lake City.

Prices and sales for the week ending July 18, 1891.

Name and Location of Company.	Opening.	Highest.	Lowest.	Closing.	Sales.
Alice, Mont	1.50	1.50	1.40	1.40	...
Alliance, Utah	....	....	....	....	.....
Anchor, Utah	5.40	5.60	5.00	5.50	.....
Apex, Utah	.15	.17	.14	.16	16,500
Barnes Sulphur, Utah	.01	.02	.01	.01½	2,500
Big Hole Placer, Mont.	.16	.17½	.15	.15	....
Centen'l Eureka, Utah	50.00	52.00	50.00	51 00	.....
Cleveland Cons'l, Utah	.25	.35	.25	.30	7,000
Congo, Utah	.19	.19	.16	.18½	9 500
Crescent, Utah	.59	.64	.55	.60	514
Daly, Utah	20.00	20.25	20.00	20.25	.....
Glencoe, Utah	5.50	6.00	5.50	6 00	100
Horn Silver, Utah	3.20	3.30	3.10	3.30	850
Malad Con., Idaho	.03	.04	.03	.04	6,100
Mammoth, Utah	2.25	3.00	2.25	2.75	.....
North Eureka, Utah	.10	.12	.10	.11	4,000
Northern Spy, Utah	....	....	....	....	...
Ontario, Utah	38.00	38.00	38.00	?8.00	....
Stanley, Utah	.06	.10	.05½	.10	13,0.0
Utah L & C. Co., Utah	...	....	....	.	....
Utah Oil Co., Utah	....	....	....	....	....
Woodside, Utah	....	....	....	....	....
Total sales					60,064

St. Louis. July 22.

(From our Special Correspondent.)

Mining matters continue very dull in St. Louis, and on 'change a sale a day appears to be the average. Prices are for the most part stationary, only one or two quotations being effected this week. From all appearances the dullness in the mining market will continue until cooler weather prevails, as since the hot spell has come on trading has dropped to a very low point.

Granite Mountain rose slightly, and from an opening quotation of $21 closed to-day on call at $22.50. No sales were made this week on 'change, though it was rumored that 100 shares sold at private sale at $22.50. The stock is decidedly scarce at present. The weekly shipments amounted to 40 bars, containing 55,250 oz. of silver and 79 oz. of gold.

Yuma was very weak and declined from 71¼c. to 47½c. At the opening figure 1,300 shares sold, followed on Friday by a sale of 100 shares; then all trading stopped and to-day but 47½ is offered for the stock.

With the exception of the sale of 1,000 shares at 2c. Little Albert remained very quiet at 1½c., all bids on the stock ceasing after Saturday.

Montrose fared better than it has for some time, the market going up from 50c. to 61¼c. On Friday the stock sold at 65c., 100 shares going at that figure.

Nellie, a stock which has been neglected for a month or two, was bid on call, 1,000 shares selling at 4c.; later the market fell to 3½c.

Elizabeth kept up well, considering the dull market and, with opening quotation of $1.72½, is now quoted at $1.75. Two hundred shares of stock were sold, 100 going at $1.80 and 100 on Monday selling at $1.85. The stock is held very close at $1.85@$1.90.

Silver Age rose slightly this week. The market opened at $1.05, and rose by Tuesday to $1.20, when 100 shares sold, and to-day $1.15 is offered.

From an opening bid of 42½c. Mickey Breen fell without any business whatever to 41¼c.

MEETINGS.

Blue Gravel Mining Company, at the office of the company, room 10, 320 Sansome street, San Francisco, Cal., August 4th, at 3 P. M.

Consolidated New York Mining, at the office of the company, room 79 Nevada Block, San Francisco, Cal., August 1st, at 12 M.

Lady Washington Consolidated Company, at the office of the company, room 33, Nevada Block, San Francisco, Cal., July 25th, at 1 P. M.

McMillen Silver Mining Company, room 24, No. 328 Montgomery street, San Francisco, Colo., August 5th, at 2 P. M.

Vermont Manganese Company, at the office of the company, room 59, No. 280 Broadway, New York City, August 11th, at 4 P. M.

DIVIDENDS.

Boston and Montana Mining Company, dividend No. 13, of $1 per share, $125,000, payable August 20th, at the office of the company in Boston, Mass. Transfer-books close July 20th and reopen July 31st.

Clay County Mining and Milling Company, dividend No. 10, of two cents per share, $4,000, payable July 30th, at the office of Messrs. Taylor & Rathvon, Room 7, Patterson and Thomas Block, Denver, Colo. Transfer-books close July 23d and reopen July 31st.

Gold Rock Mining Company, dividend No. 2, of .00¾ per share, $3,750, payable July 25th, at the office of the company, Room 7, Patterson and Thomas Block, Denver, Colo. Transfer-books close July 15th and reopen July 26th.

Little Rule Mining Company, dividend No. 17, of two cents per share, $10,000, payable July 29th, at the office of the company, No. 1624 Curtis street, Denver, Colo. Transfer-books close July 25th and reopen July 30th.

Quincy Mining Company, dividend No. 46 of $5 per share, $200,000, payable Aug. 16th, at the office of the company, in Boston, Mass. Transfer-books close July 25th and reopen July 31st.

ASSESSMENTS.

COMPANY.	No.	When levied.	D'l'nq't in office.	Day of sale.	Amt. per share.
Alliance, Utah	14	June 19	July 21	Aug. 10	.10
Best & Belcher, Nev	49	June 23	July 28	Aug. 18	.50
Clara, S. Dak	4	June 2	July 20	Aug. 15	.25
Challar, Nev	30	July 14	Aug. 18	Sept. 8	.50
Crown Point, Nev	55	July 9	Aug. 13	Sept. 3	.50
Garden City, S. Dak	....	July 14	Aug. 14	Sept. 2	.001
Goodman, Nevada	10	June 2	July 4	Aug. 6	.05
Hartrey Con, Cal	8	July 7	Aug. 11	Aug. 29	.05
Himalaya, Utah	9	May 27	June 27	July 27	.00½
onorine, Mich	....	June 26	Aug. 1	Aug. 31	.05
Inyo Marble, Nev	13	May 26	July 10	July 28	.10
Iron Hill, S. Dak	20	June 27	Aug. 3	Aug. 25	.03
Justice, Nev	48	July 11	Aug. 15	Sept. 4	.25
Northwestern G. & S., B. C.	3	June 18	July 31	Aug. 24	.08
Pocahontas, S. Dak.	7	July 15	Aug. 18	Sept. 7	.001
Saratoga, Nev	1	June 20	July 24	Aug. 12	.02
Seg. B. & Midas, Nev	8	June 16	July 20	Aug. 10	.25
Silver King, Ariz	6	May 20	June 29	July 2*	.20
Teresa, Mex	4	June 8	July 11	July 29	.10
Troy, S. Dak	6	June 30	Aug. 3	Aug. 22	.00¼
U. S. Grant, S. Dak	3	June 26	July 30	Aug. 15	.001
Wood River, Idaho	2	June 12	July 13	Aug. 10	.00½

PIPE LINE CERTIFICATES.

(Specially reported by Messrs. WATSON & GIBSON.)

Brokers are living in hopes of a revival of the business during the coming fall and winter; they think the opposition to the Standard interests may possibly come into the market as buyers and traders in the crude certificates, both for manufacturing and speculative purposes, and they would gladly welcome such increased activity.

CONSOLIDATED STOCK AND PETROLEUM EXCHANGE.

	Opening.	Highest.	Lowest.	Closing.	Sales.
July 18	67¼	67¼	67	67	7,000
20	66⅞	67⅝	66⅞	67⅜	18,000
21	67⅜	67⅞	67¾	67¾	10.00
22	67⅜	67⅜	67¼	67½	8,000
23	67⅛	68⅛	67⅞	68⅛	19,000
24	67⅞	67⅞	67¾	67¾	6,000
Total sales in barrels					68,000

NEW YORK STOCK EXCHANGE.

	Opening.	Highest.	Lowest.	Closing.	Sales.
July 18	....	....	....	....	.....
20	....	....	....	....	.....
21	67½	67½	67½	67½	5,000
22	....	....	....	....	.....
23	....	....	....	....	.....
17	....	....	....	....	.....
Total sales in barrels					5,000

COAL TRADE REVIEW.

NEW YORK, Friday Evening, July 24.

PRODUCTION OF BITUMINOUS COAL for week ending July 18th, and year from January 1st:

WESTERN SHIPMENTS.			
Pittsburg, Pa	20,379	565,875	473 319
Westmoreland, Pa	29,473	969,287	746.753
Monongahela, Pa	11,339	317,624	246,343
Total	61,191	1,852,786	1,471.445
Grand total	384,018	11,357,323	9,921,570

EASTERN AND NORTHERN SHIPMENTS.

	1891. Week.	1891. Year.	1890. Year.
Phila. & Erie R.R.	3,128	57,923	72,013
Cumberland, Md.	81,032	2,271,869	1,993,908
Barclay, Pa.	3,981	100,514	80,589
Broad Top, Pa.	10,642	270,101	281,481
Clearfield, Pa.	68,558	2,213,446	2,110,968
Allegheny, Pa.	21,562	703,682	724,652
Beach Creek, Pa.	45,363	1,270,541	1,019,320
Pocahontas Flat Top	50,140	1,348,947	1,042,476
Kanawha, W. Va.	38,421	1,267,514	1,124,718
Total	322,827	9,504,537	8,450,125

STATEMENT of shipments of anthracite coal (approximated) for the week ending July 18th, 1891, compared with corresponding period last year.

Regions.	July 18, 1891.	July 19, 1890.	Difference.
Wyoming Region. Tons	483,055	440,187 Inc.	42,868
Lehigh Region "	136,500	132,031 Inc.	4,469
Schuylkill Region "	270,013	250,265 Inc.	19,748
Total..... Tons	889,568	822,483 Inc.	67,085
Total for year to date Tons	20,098,026	17,397,432 Inc.	2,700,594

PRODUCTION OF COKE on line of Pennsylvania R. R., for the week ending July 18th, 1891, and year from January 1st, in tons of 2,000 lbs.: Week, 108,090 tons; year, 1,935,318 tons; to corresponding date in 1890, 2,955,732 tons.

Anthracite.

The production for the week ending the 18th inst was 889,598 tons, an increase over the corresponding period of 1890 of 67,085 tons. Thus far this month returns are in for two entire weeks' production, namely 836,492 + 889,598 = 1,726,092 tons. Counting on 27 working days, this month's production at that rate will be 3,887,680 tons. When we consider that it was agreed to rigidly adhere to an output of 3,000,000 tons for the month, it can be readily seen that restriction is not being enforced. It is expected that the returns for the current week will show a proportionately large production.

It is extremely difficult to say just what is the incentive which prompts the companies to ride over their agreement in the manner indicated. They all complain of a dull market and no sales (a condition expected at this season of the year). They also realize the detrimental effect which a surplus of even 100,000 tons has upon the market. If they had not been of the belief that the trade would be best served by a minimum product of 3,000,000 tons for July, they would have made it larger. In the face of these facts it looks as if a production like the one which is going on was brought about through the agency of a ruling spirit, and that the remaining operators were trying to keep up with the procession.

The question of prices, while being an open one, can be dismissed with the statement that not a few deliveries are being made on the June circular, and that July prices rule on what little new business is offered. This applies to the companies. Certain independent operators are without doubt cutting rates, and while the offerings are insignificant, just at this dullest of all dull seasons, the action has the effect of unsettling buyers. In fact the inclination on the part of this class to hold off in the hope that by some hook or crook they will be able to obtain coal for next to nothing, gives anything but a roseate tinge to the market. The future price is uncertain.

The programme outlined a month ago was to make an advance August 1st. The trade is not in shape to stand a higher price, and it is very doubtful if one will be made. We hear of the refusal of a good-sized contract to be based on the July circular and delivered through August.

No meeting of the sales agents has been called, although one will undoubtedly be held for the coming week. The subject of August outputs and prices, as well as a retrospective consideration of those for July, will be treated.

Notwithstanding the condition of affairs set forth in the preceding, the coal trade is not in the demoralized state which certain bear organs would make out. The product is not accumulating in a way which threatens to force the bottom out of the market. To be sure, the neglect of the sales agents in conforming with rules laid down by themselves is going to shake the confidence in the trade, but with the revival of business in the fall, which of necessity must be considerable owing to the present inactivity, these dissenting elements in the market will be covered up.

We publish in another column the substance of the answer of the Lehigh Valley Railroad Company to the Interstate Commerce Commission's petition in the case of Coxe Bros. & Co.

Mr. J. C. Haddock informs us that the taking of testimony by deposition in the cases of J. C. Haddock, and Haddock, Shank & Co. vs. the Delaware, Lackawanna & Western Railroad Company will commence on the 27th inst.

Bituminous.

There seems to be a surplus of stock in the hands of consumers, but a large tonnage is still coming forward notwithstanding. The companies are all running over their allotment, and seem to evince no anxiety concerning this fact, inasmuch as they are all in the same boat. In reality, so long as prices are maintained, and it is a conceded fact that they are so rigidly, it makes little difference what the tonnage is. We hear of a scarcity of cars. This aggravation, so prominently manifest every fall, promises to be more marked than ever this year, owing to the large grain traffic which has already been contracted for. At the present time ocean freights are unprecedentedly low, 65c. being quoted for medium-sized vessels from Philadelphia to Boston, with 5c. higher from Baltimore. These low rates are having a detrimental effect upon the eastern trade in more ways than one. A rise is not looked for until the grain is presented for ocean movement.

Boston. July 23.

The anthracite market continues dull and featureless. Most of the companies are still at work on old orders, which is really all there is to attend to. The much-expected improvement has not shown up as yet, and, judging from the present state of the market there is no telling when it will come. Coal continues to come forward at a steady rate, but it is not allowed to stand for any great time, and the market does not feel its presence. As to the matter of prices there is a wide difference of opinion. Some of the principal agents are holding out, in a measure, for the July circular, while sales are reported at even May figures. These latter prices are credited to individuals, and those in a position to know say that the June price is as high as the market will stand.

The improvement noted in the bituminous situation was only of a temporary kind, and the market lost little time in getting back into its old rut. Coal is offering freely, and everybody seems to have a bountiful supply. Prices rule easy, lots on cars here commanding at most $3.40.

The freight situation rules much the same as at last report. Plenty of vessels are obtainable, with very little call for them. From New York 60@65c. is quoted; from Philadelphia 70@80c., and from Baltimore 75@90c.

The retail market moves in a steady manner. The demand is rather small, and as dealers have a fair supply on hand they are not buying any coal, preferring to wait for an improvement. Prices hold steady.

The receipts of coal at this port for the week ending July 18 were 65,810 tons of anthracite and 17,318 tons of bituminous, against 46,123 tons of anthracite and 23,467 tons of bituminous for the same week last year. The total receipts thus far this year have been 995,985 tons of anthracite and 691,078 tons of bituminous, against 858,985 tons of anthracite and 540,144 tons of bituminous for the same period last year.

Buffalo. July 23.

(From our Special Correspondent.)

The wholesale anthracite and bituminous coal trades are very dull; the Western receiving points are crowded with anthracite and there is a superabundance of bituminous in all directions. It is reported that business is demoralized considerably in consequence of the competition between some of the railroad companies and the mine owners. May quotations are said to be the ruling figures in nearly all deals. The local trade in anthracite is very dull, and the demand from manufacturers for bituminous continues very light; the latter can be said to be purchasable at any price at times. Coke is quiet and unchanged.

It has been asserted that the action of the Delaware, Lackawanna & Western Coal Company in publicly offering anthracite coal at May prices may have the effect of causing a restriction of production and that therefore "good may yet come of the open cut." *Bradstreet* said some time since that the effort to restrict production at the mines "was the customary monthly farce," and "when the failure to live up to regular monthly nominal advances in prices of coal is also recalled the extent of the farce may be inferred."

The Ohio & Pennsylvania Coal Company has just purchased the propeller "Alcona" and the barge "Alta." The former is valued at $45,000; the latter at $38,000.

From the last report of U. S. Engineer Stickney it is proposed during the coming year to extend the Buffalo breakwater 450 ft. and complete the restoration of about 2,000 ft. of the present structure. He also has sent in estimates for completing other harbor work here, and for deepening the channel of Niagara River between Buffalo and Tonawanda; the total of the estimates amounts to $1,152,987.

Lake freights on coal are unsettled and lower, in consequence of the large offerings of vessels, and the anxiety of owners to obtain cargoes, while shippers hold off, as the Western depots are crowded with coal.

The rates hence for the past week were as follows: 50@60c. to Chicago; 40@60c. to Milwaukee; 30@40c. to Duluth and Superior; 30c. to Toledo; 25c. to Bay City, Amhertsburgh, and Detroit; 45c. to Gladstone; 40c. to Wathburne; and 50c. to Sault Ste. Marie, Racine, Kincardine, and Escanaba. Freights close inactive, and the situation is demoralized.

The quantity of coal shipped hence by Lake from July 15th to 22d, both days inclusive, was 70,919 net tons, distributed about as follows: 29,800 to Chicago; 14,625 to Milwaukee; 7,550 to Duluth; 3,120 to Toledo; 5,900 to Superior; 630 to Escanaba; 530 to Amherstburgh; 210 to Kelly's Island; 600 to Detroit; 400 to Kincardine; 850 to Racine; 800 to Sault Ste. Marie; 3,300 to Gladstone; 1,800 to Washburn, and 800 to Bay City.

The shipments of coal eastward by canal for third week in July amounted to 3,233 net tons; receipts, none. There were two breaks in the canal, one near Montezuma, on July 21st, the other near Schenectady, yesterday.

Canal freights on coal this season to date were: Buffalo to Syracuse, 50c.; to Fulton, 55c.; to Albany, 75c.; to Utica, 55c., and to Lockport, 35c. per net ton, free on and off.

Chicago. July 22.

(From our Special Correspondent.)

A very marked dullness is noted as far as general trade is concerned. Inquiry is fair, but there is little actual buying either by country or outside dealers or consumers. Prices are, if anything, a trifle lower in Milwaukee than they are here. We are credibly informed that all sizes of hard coal can be, and are sold there at $4.85 and less; wholesalers here have refused to meet these figures. Heavy operators are very anxious, and are urging parties who have already bought large lots to move same. The cut in lake freight to 40c. will temporarily make coal still weaker.

There is a good Lake movement of Pennsylvania and Ohio bituminous coal. Railroads and other large consumers and dealers are buying very freely and stocking up. Some shortage is noted in Illinois coal, much of which is attributed to strike conditions, etc. Some very large contracts are reported for Indiana block and Ohio coal. As to prices, they are fairly steady, though the quotations given are shaded 10@15c. to good buyers.

The stocks and receipts of anthracite by Lake and rail from May 1 to June 10 were 569,451 tons in 1891 and 376,828 tons for the same period last year.

Connellsville coke is greatly in excess of demand.

Frick's is held steadily at quoted prices, but individual operators are shading this price 10@15c. A first-class quality of West Virginia coke is selling at $4.50, and the manufacturers claim it is equal in all respects to Connellsville Basin.

Prices of anthracite per ton of 2,000 pounds f. o. b. Chicago are: Lehigh lump, $6.75; large egg, $5; small egg, range, and chestnut, $5. Retail prices per ton are: Large egg, $6; small egg, range, and chestnut, $6.

Prices of bituminous per ton of 2,000 pounds f. o. b. Chicago are: Pittsburg, $3.25; Hocking Valley, $3; Youghiogheny, $3.40; Indiana block, $2.35@$2.50; Illinois block, $1.90@$2.

Coke.—Connellsville, 72-hour, per ton f. o. b. Chicago, $5.05; crushed, $4.75; Walston, $5; New River, $5; West Virginia, $4.50.

Pittsburg. July 23.

(From our Special Correspondent.)

Coal.—We can report a firm and steady trade demand; prices are without quotable change. There have been no river shipments since our last. There was a rise in the Monongahela, but not sufficient for barges to go out with safety. The rise, however, was very beneficial, as it enabled the boats on their way up with empties to reach port; otherwise they might have been obliged to be tied up on the way until the next rise came; they are being towed to the ports to be loaded, which will give the miners employment for some time to come.

Connellsville Coke.—There has been quite an improvement in the coke market; the shipments show a material increase, and there is every sign of prosperity. Trade may be expected to fall a little from the record of last week, but even if it should it is now felt that there will be a fairly active midsummer business. The works last week ran irregularly; five of the Frick works operated but two days, while the balance ran five days. McClure's works were idle one day, as were a few of the independents. The number of active ovens will reach 13,400, with almost 2,000 inactive.

Shipments last week averaged 1,109 cars per day, as against 850 the previous week. The total increase was 1,546 cars. The following was the distributions: Points west of Pittsburg, 3,369 cars; to Pittsburg and river tipples, 2,310 cars; to points east of Pittsburg, 971 cars; total, 6,650. Previous week, 5,104; increase, 546 cars. Prices are unchanged, viz.: Furnace, $1.90; foundry, $2.30; crushed, $2.65. Freights are the same as for some time.

METAL MARKET.

Prices of Silver Per Ounce Troy.

NEW YORK, Friday Evening, July 24, 1891.

July	Sterling Exch'ge.	Lond'n Pence.	N. Y. Cts.	July	Sterling Exch'ge.	Lond'n Pence.	N. Y. Cts.
18	4.86	46	100⅝	22	4.86⅛	46⅛	*100⅛
20	4.86	45¾	100@99	23	4.86⅛	46⅛	†100⅝
21	4.86⅛	45⅝	99¼	24	4.86	45⅞	100

* Weak. † Strong.

The government having completed its purchases

for the month on the 20th, the market weakened to 99, but quickly recovered to 101 on orders from Europe for about 425,000 ozs. On the filling of these orders the market again became dull.

The United States assay office at New York reports the total receipts of silver for the week to be 83,000 ozs.

Government Silver Purchases.

The Treasury Department informs us that the amount of silver purchased during the past week was as follows:

	Offered ounces.	Purchased ounces.	Average price.
July 20	1,661,000	575,000	1·0037

Silver Bullion Certificates.

	Price. H.	Price. L.	Sales.
July 18	100⅝	100⅝	20,000
July 20	100	99	170,000
July 21	100¼	99⅜	175,000
July 22	101	100¼	220,000
July 23	101	100⅝	70,000
July 24	100½	100	151,000

Domestic and Foreign Coin.

The following are the latest market quotations for American and other coin:

	Bid.	Asked.
Trade dollars	$ .78	$ .79
Mexican dollars	.78	.79
Peruvian soles and Chilian pesos	.75	.77
English silver	4.86	4.90
Five francs	.94	.95
Victoria sovereigns	4.89	4.92
Twenty francs	3.88	3.90
Twenty marks	4.74	4.78
Spanish doubloons	15.55	15.70
Spanish 25 pesetas	4.78	4.83
Mexican doubloons	15.55	15.70
Mexican 20 pesos	19.50	19.60
Ten guilders	3.96	4.00
Bar silver	1.00¼	1.01

Foreign Bank Statements.

The governors of the Bank of England at their weekly meeting on Thursday made no change in its minimum rate of discount, which remains at 2½%. In the week the bank gained £1,036,000 bullion, and the proportion of reserve to liabilities was raised from 39·03% to 42·01%, against an advance from 34·87% to 38·90% in the corresponding week last year, when its discount rate was unchanged at 4%. On the 23d inst. the bank gained £74,000 bullion. The weekly statement of the Bank of France showed an increase of 5,200,000 francs in gold and a decrease of 1,600,000 francs in silver.

Copper.—The stagnation in copper which we have had to report for some time still continues and it becomes more and more evident that the demand for the metal for electrical purposes shows a tremendous falling off compared with the two preceding years. This seems to be attributable mainly to the money market, as we hear that there are plenty of corporations and private concerns which contemplate the erection of electrical plants of all kinds, and simply await the time when they can obtain money at fair rates. It is therefore almost safe to predict that when this time comes manufacturers will be so crowded with orders that a large demand for copper will spring up, and this must then tell heavily on prices, which we consider unduly depressed at the moment. The larger of the lake companies are still upholding the price for copper from the mines at 13c., but some of the smaller producers, being unable to sell at that figure, have given way and made a few isolated sales at 12¾c. In the meantime, lake ingot copper stored in New York is readily obtainable at 12⅝c., and large quantities, we are sure, could be had at somewhat less. At the same time so great a scarcity in casting copper has seldom been witnessed before; none of the producing companies are up to their obligations, having been entirely cleared out by heavy shipments to Europe. It is therefore very easy for them to uphold the price of casting copper, which we quote to-day at 12¼@12½c. for carload lots, and 12⅝@12¾c. for cask lots. Arizona pig copper is not offered at all in this market except for distant delivery, and then at figures which are rather above its relative value.

As to the statistical increase of 500 tons on the other side, which increase was noted in our last report, the only wonder is that, considering the heavy shipments from this side, the increase was not larger. The speculative market in London has experienced a rather sharp decline, this being attributed, first of all, to the unsettled condition of the money market on account of a further failure of a South American bank, and secondly, to the persistent selling of some of the larger operators. Prices came down quickly by Wednesday to £52 5s. and, although the hammering continued, heavy quantities were taken up by consumers and speculators, and a large business resulted at somewhat hardening rates, the closing prices being £52 7s. 6d. for spot, and £52 12s. 6d. for futures. Business in refined brands was rather irregular, as producers generally refrained from offering anything at all during the decline, not being willing to follow the course of the speculative market, and quotations are therefore partly nominal, and so irregular that we prefer not to give any figures to-day.

The exports of copper from the port of New York during the past week were as follows:

To Liverpool—	Copper Matte.	Lbs.	
S. S. City of Berlin	1,750 bags.	219,506	$15,000
" Greece	1,740 "	204,410	15 000
" Cuflc	2,151 "	240,000	15,000
" Wisconsin	4,006 "	449,516	31,000
	Copper.		
S. S. California	360 bbls.	450,000	$58,500
" City of Berlin	1,237 pigs.	343.008	41,100
" Greece	764 pigs.	225,822	25,440
" Cuflc	1,215 pigs.	330.834	40,000
To Bourdeaux—	Copper.	Lbs.	
S. S. Panama	30 casks.	37,500	$4,500
" "	121 pigs.	36,080	4,500
To Rotterdam—	Copper.		
S. S. Obdam	356 casks.	110,656	12,400
To Havre—	Copper.		
S. S. La Champagne	120 casks.	149,500	17,400
" "	319 pigs.	112,170	15,000
" "	725 bars.	100,265	13,035

Tin.—This article continued on its downward course during the first half of this week, prices reaching as low as 20·25c. for spot and July delivery, but suddenly a heavy demand sprang up, and though the bears put out some tin in order to keep the quotations down, the buying was so strong that after some business had been done at 20·50c. prices advanced quickly, closing very strong to-day at 20¾c. for spot and July, 20½c. for August, 20·40c. for September. So far little business has been done in futures, the attention being mostly confined to July and August. We have repeatedly pointed out that the stocks over here have dwindled to a dangerous point, and shipments on the way, which will arrive during the next few weeks, are also rather light.

London, too, was weak after the close of our last report, but suddenly a large demand was noticed, and on heavy bidding prices advanced sharply. The lowest point reached was £90 10s. for spot and £91 for futures, on Tuesday, against to-day's closing prices of £91 15s. and £92 5s., respectively.

Lead has been neglected, there not being much disposition on either side to do anything, and quotations have gone down somewhat, but at reduced prices very little of the metal is offered, and we have to quote 4⅛c.@4.40c., though a few isolated sales have been made below these figures. The market appears to be better in the west, where comparatively higher prices are obtainable.

The London quotation for Spanish lead is £12 7s. 6d. and for English lead £12 12s. 6d.

St. Louis Lead Market.—The John Wahl Commission Company telegraphs us as follows: "Weak seaboard advices have caused our buyers of lead to be very timid, and only such lots as are needed for immediate requirements are negotiated. At the close the metal has sellers at 4·20c."

Spelter continues on the irregular course which we have had to report for some time; some of the fancy brands command pretty steady prices, but where consumers are not particular as to brand they can buy to advantage. Sales are reported at from 5·05c.@5c., New York. Besides some of the smelters appearing to have stocks on hand it is reported that about 30 carloads belonging to speculators are offered on the market.

In London the quotations for specials are £24 2s. 6d., and for ordinaries £23 17s. 6d.

Antimony remains dull, with very little business doing. We quote Cookson's, 12¾c.; L X, 12c., and Hallett's 11½c.

Nickel continues in good demand, but the scarcity of spot metal prevents business.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, July 24.

During the week just past reports received from all the iron-producing centers of the country show that the quiet condition of the trade has not been modified by anything new. Business of a hand-to-mouth nature goes on just as it has for months, there being no reason whatever for any change. A review of the general situation during the past six months will be found upon our editorial pages.

American Pig Iron.—Rumors of extraordinarily low prices being quoted for No. ix Southern iron have been afloat during the week, but it may be safely said that there has been no sale at anything like the alleged figures. There is some accumulation of low-grade iron—partly in warrants—which nobody wants, and it is possible that low quotations were given for some of this class. The higher grades, both Northern and Southern, are by no means over-abundant.

There has been no change whatever in the general features of this market. There is some inquiry, but buyers appear unwilling to pay even the present low prices. We quote: Northern, No. ix, $17@18; No. 2 x, $16@17. Southern, No. ix, $17@18; No. 2 x, $16@17.

Spiegeleisen and Ferro-manganese.—This market continues dull and featureless, no sales of any magnitude being reported. Quotations are: Spiegeleisen, 20%, $27.50@$28; ferro-manganese, 80%, $64@$65.

Steel Rails.—Not much business is going on in this market. The strike at the Pennsylvania Steel Company's Works at Steelton continues and the works remain closed down, much to the pleasure, it is said, of the officers.

It is known that the Pennsylvania Railroad has need of large quantities of rails, but the mills appear firmly determined to maintain the prices agreed upon, and no inducements in the shape of large orders which the company may make will cause them to break the compact.

It is doubtless true that the prospects for higher prices are slimmer than slimness itself, but probably neither will there be a reduction. In the present condition of the money market mills are afraid to accept the paper of new railroads, and they still adhere to a determination to do a cash business at the schedule quotations: $30 at mill and $30.75 at tidewater.

Rail Fastenings.—Dull as dull can be is the situation in this market. Spikes are nominally higher, being quoted at $2.10@$2.15, but we know of a prominent dealer of this city who offered spikes at $2.15 at Charleston, and whose offer was declined. Other quotations are: Angle plates, 1·70@1·80c.; bolts and square nuts, 2·75@2·85c.; hexagonal nuts, 2·95c.; complete joint, iron and steel, acording to weight.

Tubes and Pipe.—Business in tubes and pipe is a little quiet just now. Ruling discounts on carload lots are as follows: 47½% on butt, black; 40% on galvanized: 60% on lap, black; 47½% on lap, galvanized; boiler tubes, 50% on all sizes; casing, all sizes, 50%.

Structural Material.—The condition of this market is healthy, manufacturers reporting a good amount of business. Quotations are nominally given at: Universal plates, $2.25; bridge plates, $2.10; beams, $3.10, although it is probable that less would be quoted for a desirable order.

Merchant Steel.—Some manufacturers report a very good market, while others claim that it is dull. We think that on the whole it is very fair. We quote as follows: Best English tool, 15c., net; American tool steel, 7@8c.; special grades, 13@20c.; crucible machinery steel, 5c.; crucible spring, 3¾c.; open-hearth machinery, 2·50c.; open-hearth spring, 2·60c.; tire steel, 2·50c.; toe calks, 2·50c.; first-quality sheet, 10c.; second-quality sheet, 8c.

Old Rails.—No business is reported. Quotations, which are merely nominal, are $21@$22.

Wrought Iron Scrap.—Practically dead. We quote $21@$22 at yards.

NOTES OF THE WEEK.

A dispatch from the Republic iron mine received at 6 P. M. this evening states that the fire is not so serious as has been reported, and that it will not be necessary to flood the mine. The fire is confined to No. 5 shaft and cannot possibly communicate to other parts of the mine, as there is no timber to carry it. Superintendent Pasco hopes to have the mine clear of gas and smoke and in working order by the end of next week. The total damage will not exceed $10,000.

Cleveland.

(From our Special Correspondent.)

The long continued dullness and depression in all departments of the iron ore business of Lake Superior has been lately relieved by a slight boom in lake freights. Grain is coming forward more freely, creating a demand for boats to land at Chicago, consequently ore men, in order to get vessels, have been obliged to pay this week 80 cents, $1 and $1.05 respectively from Escanaba, Marquette and Ashland or Two Harbors. This is a clear advance of 25c. a ton, and, if maintained, as is very probable, ores will have to advance in price. Some sales continue to be made at the current low prices, viz., $4.50 for Cleveland and Lake Superior No. 1 and Vermilion, yielding 65% to 67% in iron; $4 for Cleveland Scotch, Cliffs Shaft, and Red Lake; Chapin, $4; Buffalo Mining Company's ores $3.50; Winthrop & Cleveland Lake hematite, $3.75; Ashland, Aurora, Norrie, *et al.*, $4.25; Chandler, $4.50. The Minnesota Iron Company is going to buy the control of the Chicago & Minnesota Iron Company (which latter company owns more than half of the Chandler Iron Company). The terms of the purchase are one and a quarter shares of Minnesota Iron Company for one share of Chicago & Minnesota Iron Company stock. This will give the former almost absolute control over all the properties shipping ores from Two Harbors, Minn. We quote:

Specular and Magnetic Ores.

Bessemer	66@69	$5.25@6.00
"	60@64	4.25@5.00
Non-Bessemer	66@69	4.50@4.75
" "	62@65	4.00@4.50
" "	57@60	2.75@3.75

Soft Hematites, Dried at 212°.

Bessemer	62@65	$4.00@4.50
"	58@61	3 50@4 00
Non-Bessemer	55@63	2.75@3.25

Above prices are for deliveries at Lake Erie ports.

Chicago. July 23.

(From our Special Correspondent.)

Southern pig iron, both coke and charcoal, is weaker, and offerings of both grades have been made at lower figures than were current a week ago. Local and Northern irons appear to hold their own fairly well. One effect of the strike of the architectural iron finishers has been to change the plans of at least one of the large steel struc-

tures now in course of erection, which called for ornamental iron staircases, for which hard wood has been substituted. Agents of rolling mills who have warehouses at this point, are having a large demand from railroads for bars and other iron for quick delivery in ten to twenty ton lots, most of which is for car repair work. Orders for steel rails are coming forward more actively, though they are not as yet for large quantities; the aggregate tonnage is quite fair, however. Manufactured iron and steel generally is in moderate demand with the exception of light sheets. Some little movement is noted in old material and scrap.

Pig Iron.—The market is unmistakably dull, and, with very few exceptions, the demand is now chiefly for small quantities, carloads being an especial feature, particularly for the better grades of local cokes, Ohio softeners and Southern softs Nos. 1 and 2. For this class of business and grades of iron prices are fairly well maintained. Lake Superior charcoal iron is quiet, but could be sold if furnaces would accept prices ruling six weeks ago. As they are well sold up, overtures which have been made are steadily refused. The weak spots are almost entirely eliminated, the lowest quotation we hear of being $17.50, four months, equal to $17.25 cash. Southern coke and charcoal irons are weak and dull, though we hear of a sale of 1,300 tons of the former for scattered deliveries and two lots, each 1,000 tons, to local consumers. The heavy fruit shipments from the South are said to be responsible for the reported shortage of cars for pig iron movement. Foundries are now busy and the outlook is reassuring.

Quotations per gross ton f. o. b. Chicago are: Lake Superior charcoal, $17.50@$18; Lake Superior coke, No. 1, $15.75@$16; No. 2, $15.25@$15.75; No. 3, $14.25@$14.50; Lake Superior Bessemer, $17.50; Lake Superior Scotch, $17@$17.50; American Scotch, $18@$18.50; Southern coke, Foundry No. 1, $16; No. 2, $15.25; No. 3, $14.50; Southern coke, soft, No.1, $15.50; No. 2, $14.50; Ohio silveries, No. 1, $18; No. 2, $17; Ohio strong softeners, No. 1, $18.50; No. 2, $17; Tennessee charcoal, No. 1, $17.50; No. 2, $17; Southern Standard Car Wheel, $21@$22.50.

Structural Iron and Steel.—Inquiries continue good, but the amount of business closed is disappointing. Several new enterprises requiring large lots of beams and shapes are postponed for the present. Quotations for car lots f. o. b. Chicago are as follows: Angles, $2@$2.10; tees, $2.60@$2.70; universal plates, $2.35@$2.45; sheared plates, $2.30@$2.40; beams and channels, $3.20.

Plates.—The feature of this specialty is the frequency of small orders for prompt shipment, the aggregate tonnage being considerable, most probably due to the closing of so many mills. A local agent sold 1,000 tons of track steel at $2. f. o. b. Chicago, the lowest price yet made in this market. Prices from store are easy. Steel sheets, 10 to 14, $2.70@$2.80; iron sheets, 10 to 14, $2.60@$2.70; tank iron or steel, $2.50@$2.70; shell iron or steel, $3@$3.25; firebox steel, $4.25@$5.50; flange steel, $3.25@$3.40; boiler rivets, $4.25; boiler tubes, 2¾ in. and smaller 55%, 3 to 6 in. 65%, 7 in. and upward 55%.

Merchant Steel.—Implement makers continue to place small orders, and the outlook is very favorable for further business in mill lots. The better grades of tool steel are in fair demand. Prices remain unchanged: Tool steel, $6.75@$7; tire steel, $2.30@2.50; toe calk, $2.50@$2.65; Bessemer machinery, $2.20@$2.30; Bessemer bars, $2@$2.10; open-hearth machinery, $2.60@$2.75; open-hearth spring, $2.75@$3; crucible spring, $3.75@$4.

Steel Rails.—There is more inquiry than there has been for the past two weeks, and we hear of a 1,000 lot for a western road being placed with an eastern mill for very early delivery. Light weight sections are also in much better demand. On desirable orders $31 is quoted, on all other $31.50@$32.50. Some good orders have been placed for iron splice bars; other track supplies are in fair demand. Splice bars are quoted: $1.95@$2 for steel and $1.85@$1.95 for iron, and spikes at $2.05@$2.10 per 100 lbs.; track bolts, hexagonal nuts, $2.85@$2.90.

Galvanized Sheet Iron.—Business is less active and discounts unchanged at 67½% off on Juniata and 67½% and 5% off on charcoal.

Bar Iron.—Local and nearby mills are sold up well into September, and hold steady at 1·68@1·70c. Some car specifications are in the market, and will probably go at 1·70c. flat. General demand is moderately fair; store trade is good for good sized lots, and dealers quote 1·80@1·90c. rates, according to quality, etc.

Black Sheet Iron.—Mill business is quiet at 2·90c. for No. 27 Chicago. Dealers quote 3·2c., same gauge, from stock.

Nails.—Steel cut are in light demand from factory, and local and nearby mills are stiffer in their views. Wire nails are improving and more sales are reported by mill agents than for several weeks past. Jobbers report trade light and quote $1.75 on the former and $2.15 on the latter.

Scrap.—A sale of 500 tons No. 1 wrought was made last week at $19.65. All other grades are quiet. Quotations are: No. 1 railroad, $19.50; No. 1 forge, $18; No. 1 mill, $14; fishplates, $21; axles, $23; horseshoes, $18; pipes and flues, $13; cast borings, $8; wrought turnings, $10.50; axle turnings, $12.50; machinery casting, $11.50; stove plates, $8; mixed steel, $11; coil steel, $15.50; leaf steel, $15.50; tires, $17.

Old Rails and Wheels.—Five hundred tons old iron rails sold at $23.25, and 1,000 tons at $23.50. An offering of 1,500 tons at $24 was refused by a mill near here. Steel rails are quiet at $14.50@$16.50. Car wheels are inert at $16, nominally.

Louisville. July 18.

(Special Report by Hall Bros. & Co.)

Extreme quietness pervades the market; sales for the past week have been for small quantities, buyers generally refusing to purchase more than enough to cover nearby requirements. Furnaces, on the other hand, appear to have their order books comfortably filled for the present; some of them display an unwillingness to make engagements far into the future, but the larger companies are contracting ahead. Hopes for improvement in iron circles are placed in the early marketing of the crops, which are now beginning to move, but the apparent inadequate supply of cars will, it is feared, retard the crop movements very materially. Railroads have refrained from placing large orders, probably both on account of the closeness of money matters and the uncertainty of the outcome of the crops, but as the latter is beginning to assert itself more clearly as harvest goes on it is thought the roads will, before long, give extensive orders for new rolling stock, as well as for repairing the old; even if this is done, however, it will require considerable time for the manufacturers to turn out the work, so matters will be held back that much in any event. There are some who believe there will not be very large orders for new cars, for the reason that railroads are working conservatively. On the other hand car builders claim prices now ruling do not afford sufficient profit, and while some of them can and will take business now there are others who would not like to fill up at present. The banks are meeting the legitimate business demands for money, but persistently refuse where it is wanted for other purposes. We quote:

Hot Blast Foundry Irons.—Southern coke, No. 1, $14.25@$14.50; No. 2, $13.75@$14; No. 3, $13.25@$13.50. Southern charcoal, No. 1, $16.50@$17; No. 2, $16@$16.50. Missouri charcoal, No. 1, $17@$17.50; No. 2, $16.50@$17.

Forge Irons.—Neutral coke, $12.50@$13; cold short, $12.50@$13; mottled, $12@$12.25.

Car Wheel and Malleable Irons.—Southern, standard brands, $19.50@$20; Southern, other brands, $17.50@$18. Lake Superior, $20.50@$21.50.

Philadelphia. July 23.

(From our Special Correspondent.)

Pig Iron.—During the past week trade has remained in about the same condition as for several weeks past, that is to say very little doing; still one can hardly expect very much at this time of year. There is quite a little anxiety felt, however, over the continued depression in the iron trade generally, especially because at this time some large orders were expected. There has been a large increase in the output of pig iron, but prices remain unchanged. There has not been much of a demand, although some few small sales are reported. No. 1 foundry is quoted at $17.75@$18; No. 2, $16.50@$17; forge, $14.50@$15.

Foreign Material.—Some few lots of ferro-manganese have been taken at $64.50 for 80%.

Muck Bars.—There is little or nothing doing in the muck bar line at present. A few parties have been inquiring during the past week, but at prices quoted, $26.75@$27.25, no sales have been made.

Steel Billets.—Quotations on steel billets have advanced a trifle, being now from $28.25 to $28.50, but buyers are not placing any orders at this time, saying they can do better. Nail slabs are offered at $28. One sale of 1,500 tons has been made and is reported at $27.25.

Bar Iron.—Several of the mills have not yet resumed work, and there is very little activity at present. It is not known just when they will start up. As long as these mills are idle prices will remain firm at old quotations, but a general resumption of work would be likely to weaken prices. City iron is held at $1.75 to $1.80.

Nails.—There is no improvement worthy of note in the nail trade this week. Prices remain the same as last quoted.

Sheet Iron.—There is not much inquiry for thin sheets, but mills are busy on heavier sizes, which are selling along in a quiet way. Quotations for best refined are 3@3·50c.; best soft steel, 4c. Galvanized is dragging at this time, with discounts on best bloom 67½%.

Wrought Iron Pipe.—There has been a fair demand for wrought iron pipe during the past week Although old prices were reaffirmed at the meeting held some time since of the Pipe Association, still 5% is sometimes allowed on a large order. Discounts on butt welded black, 55%; butt welded galvanized, 45%; large boiler tubes, 60%.

Structural Material.—The large orders which have been expected for some time for structural material have not yet been received, but makers are hopeful for the future. There has been a slight restriction in output, which keeps prices of angles firm at $2.05@$2.10. Beams and channels, iron or steel $3.10. Tees, $2.50@$2.60.

Plate and Tank Iron.—Mills are working along at the usual pace at this time, some few with all the work they can handle, while others are anxiously looking after orders. There are not many inquiries at present, and in some instances shadings of one-twentieth have been given on a good-sized order. Tank plates, 2@2·10c.; shell, 2·30@2·40c.

Steel Rails.—One sale of 5,000 tons is just reported at $30 at mills. Small lots are selling as usual, but no large orders are being placed. Prices continue at $30 for large lots, and $30.50@$31 on small lots.

Old Rails.—There is nothing of note to be said in regard to old rails at this time. Quotations are $21.50@$22.

Scrap.—Some few sales of scrap have been made, and at the following prices, according to point of delivery, $21.50@$22.50.

Pittsburg. July 23.

(From our Special Correspondent.)

Raw Iron and Steel.—The market has shown signs of weakness as regards certain articles since our last report. Well-informed parties predict a quiet market for the next three weeks, as quite a number of leading iron men are leaving town for their vacations.

The Shenango and Mahoning Valley furnaces are still selling a good deal of iron, prices being fully up with those of Pittsburg. Southern iron does not seem to be wanted; we have learned of no transactions for some time.

The outlook for the fall and winter months is encouraging, but at the moment there are no positive indications of any change either for better or worse. A well-informed Eastern broker says: "Business is light in all departments, although prices are generally maintained. There is demand enough for both crude and finished irons to absorb all the current production, so that very little material goes into store for want of purchasers. The production of pig iron is rapidly increasing. Of course it is but natural that a little weakness should be shown here and there in the prices of certain grades of pig."

The situation, as compared with last week, is as follows: Bessemer pig not so much fancied; prices a shade weaker; consumers evidently well supplied. Grey forge weaker, being 10@15c. per ton lower. Steel slabs and billets, prices 25@50c. lower, August and September. Muck bar steady at last week's figures. Skelp iron: Narrow and wide grooved unchanged. Sheared iron declined five cents. Ferro maganese: Pittsburg prices for domestic are maintained; New York delivery a shade lower. Steel wire rods unchanged. Scrap material dull, prices weaker.

Coke Smelted Lake and Native Ores.

3,000 Tons Bessemer, Aug., Sept	$16.25 cash.
2,500 Tons Bessemer, July, Aug	16.20 cash.
2,500 Tons Grey Forge	14.00 cash.
2,000 Tons Bessemer, July, Aug	16.25 cash.
1,500 Tons Grey Forge	14.15 cash.
1,500 Tons Grey Forge at Valley furnace, Aug., Sept	14.00 cash.
1,000 Tons Grey Forge at Valley furnace, Aug., Sept	13.80 cash.
1,000 Tons Bessemer, July	16.00 cash.
1,000 Tons Grey Forge	14.00 cash.
500 Tons Grey Forge at Valley furnace, July., Aug	13.90 cash.
500 Tons Bessemer	16.25 cash.
500 Tons Bessemer	16.30 cash.
500 Tons Grey Forge	14 00 cash.
500 Tons Grey Forge	14.60 cash.
500 Tons Grey Forge	14.00 cash.
200 Tons No. 2 Foundry	15.25 cash.
200 Tons Grey Forge, all ore	15.00 cash.
200 Tons Grey Forge, all ore	14.75 cash.
100 Tons No. 3 Foundry	14.75 cash.
100 Tons No. 1 Foundry	16.25 cash.

Steel Slabs and Billets.

2,000 Tons Billets, Aug., Sept., Oct	26.25 cash.
1,500 Tons Billets & Slabs, Aug., Sept	26.25 cash.
1,000 Tons Billets, Aug	26.25 cash.
1,000 Tons Billets, Wheeling del	25.75 cash.
750 Tons Billets, Aug., Sept	26 25 cash.
500 Tons Slabs	26.00 cash.

Muck Bars.

2,000 Tons Neutral, Aug., Sept	27.00 cash.
1,500 Tons Neutral, July, Aug	27.00 cash.
1,000 Tons Neutral, Aug., Sept	26.75 cash.
1,000 Tons Neutral, Aug., Sept	27.00 cash.
500 Tons Neutral, Aug	26.75 cash.

Ferro-Manganese.

150 Tons 80%, Domestic	66.50 cash.
200 Tons 80%, New York	63.80 cash.
50 Tons 80%, Seaboard	64.00 cash.

Skelp Iron.

1,000 Tons Sheared Iron	1.82½ 4 m.
750 Tons Wide Grooved	1.65 4 m.
500 Tons Narrow Grooved	1.62½ 4 m.

Steel Wire Rods.

750 Tons American fives	36.50 cash.
500 Tons American fives	36.50 cash.

Bloom, Beam and Cup Ends.

1,800 Tons Bloom and Beam Ends	18.12½ cash.
500 Tons Billet Ends	18.00 cash.

Old Iron and Steel Rails.

600 Tons Long Steel Rails	18.75 cash.
500 Tons Long Steel Rails	18.50 cash.
500 Tons Old Iron Rails	23 00 cash.

Scrap Material.

600 Tons No. 1. R. R. Scrap, to valley mill, net	19.85 cash.
100 Tons Iron Axles, hammered, net	28.00 cash.

Charcoal.

130 Tons Southern Warm Blast	20.00 cash.
125 Tons No. 2 Foundry	21.00 cash.
50 Tons Cold Blast	26.50 cash.

DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Shares. Par	Assessments. Total levied.	Assessments. Date and Amount of last		Dividends Total paid.	Dividends Date & amount of last.		
1	Adams, s. L. C.	Colo.	$1,500,000	150,000	$10	*			$585,000	June	1891	.05
2	Alice, s.	Mont.	10,000,000	400,000	25	*			920,300	April	1891	.06¼
3	Alma & Neil Wood., G	Idaho	300,000	30,000	10	*			60,000	Jan.	1889	.50
4	Amador, G.	Cal.	1,250,000	250,000	5	*			31,250	Aug.	1890	.12½
5	American Belle, s.G.C	Colo.	2,000,000	400,000	5	*			50,000	April	1891	.12½
6	Americ'n & Nettie, G. & S	Colo.	.....	300,000	.....	.....	.....	.....	150,000	Nov.	1889	.10
7	Amy & Silversmith, s.	Mont.	.....	341,419	.....	.....	.....	.....	247,530	Aug.	1887	.12½
8	Atlantic, C.	Mich.	1,000,000	40,000	25	$280,000	April	1875	200,000	Feb.	1891	1.00
9	Argenta, s.	Nev.	10,000,000	100,000	100	335,000	July	1889	40,000	Feb.	1890	.20
10	Aspen Mg. & S., s. L.	Colo.	2,000,000	200,000	10	*			660,000	May	1891	.10
11	Aurora, I.	Mich.	2,000,000	100,000	20	.....	.....	.....	255,000	Mar.	1891	1.00
12	Badger, S.	Ont.	250,000	50,000	5	.....	.....	.....	37,500	Mar.	1890	.25
13	Bangkok Cora-Beil, s.	Colo.	600,000	600,000	1	*			44,510	Aug.	1890	.00½
14	Belle Isle, s.	Nev.	10,000,000	100,000	100	190,000	Dec.	1889	30,000	Dec.	1879	.25
15	Belcher, s. G.	Nev.	10,400,000	104,000	100	2,978,000	Feb.	1891	15,397,000	April	1876	1.00
16	Bellevue, Idaho, s. L.	Idaho	1,250,000	125,000	10	120,000	Dec.	1889	200,000	Jan.	1890	.10
17	Bi-Metallic, s. G.	Mont.	5,000,000	200,000	25	.....	.....	.....	760,000	June	1891	.35
18	Bodie Con., G. I.	Cal.	10,000,000	100,000	100	550,000	June	1890	1,602,572	April	1885	.50
19	Boston & Mont., G.	Mont.	2,500,000	250,000	10	*			520,000	June	1886	.15
20	Boston & Mont., C. & S.	Mont.	2,500,000	100,000	25	*			1,953,000	Aug.	1891	1.00
21	Breece, L.	Colo.	5,000,000	200,000	25	*			2,500	Feb.	1890	.01
22	Brooklyn Lead, L. S.	Utah	500,000	50,000	10	.....	.....	.....	127,000	July	1887	.05
23	Bullion, Beck. & C., s. L.	Utah.	1,000,000	100,000	10	.....	.....	.....	730,000	Nov.	1890	.50
24	Bulwer, G.	Cal.	10,000,000	100,000	10	130,000	Aug.	1889	175,000	Jan.	1884	.10
25	Bunker Hill & S.S.L.	Idaho	3,000,000	300,000	10	*			150,000	Oct.	1883	.06½
26	Caledonia, G.	Dak.	10,000,000	200,000	100	505,000	May	1885	192,000	Oct.	1890	.08
27	Calliope, s.	Colo.	1,000,000	1,000,000	.....	.....	.....	.....	140,000	Jan.	1891	.00½
28	Calumet & Hecla C.	Mich.	2,500,000	100,000	25	1,300,000	.....	.....	35,850,000	June	1891	5 00
29	Catalpa, s. L. I.	Colo.	3,000,000	300,000	10	*	.....	.....	270,000	May	1884	10
30	Centen'l-Eureka, s. L.	Utah.	1,500,000	30,000	50	.....	.....	.....	352,500	July	1891	2.00
31	Central, C.	Mich.	500,000	20,000	25	100,000	Oct.	1861	.65	1,970,000	Feb.	1891	1.00
32	Chrysolite, s. L.	Colo.	10,000,000	200,000	50	*	.....	.....	1,650,000	Dec.	1884	.25
33	Clay County, G.	Colo.	200,000	200,000	1	*	.....	.....	40,000	July	1891	.02
34	Coeur D'Alene, s. L.	Idaho	5,000,000	500,000	10	.....	.....	.....	270,000	Aug.	1891	.02
35	Colorado Central, s. L.	Colo.	2,750,000	275,000	10	*	.....	.....	406,250	Aug.	1889	.05
36	Commonwealth, s.	Nev.	10,000,000	100,000	100	170,000	Nov.	1888	.50	20,000	Nov.	1890	.20
37	Confidence, s. L.	Nev.	.....	24,960	.....	328,880	May	1889	.75	199,680	April	1889	1.00
38	Cons. Cal. & Va., s. G.	Nev.	21,600,000	216,000	100	108,000	Jan.	1885	.20	3,466,800	April	1890	.25
39	Contention, s.	Nev.	12,500,000	250,000	50	.....	.....	.....	‡2,587,500	April	1884	.25
40	**Cop. Queen Con., C.	Ariz.	1,400,000	140,000	10	.....	.....	.....	210,000	Feb.	1889	.50
41	Cortez, s.	Nev.	1,500,000	300,000	05	*	.....	.....	481,000	Feb.	1891	.46
42	Crescent, s. L. G.	Utah.	15,000,000	600,000	25	*	.....	.....	228,000	Oct.	1888	.03
43	Crown Point, G. & S.	Nev.	10,000,000	100,000	100	2,425,000	Sept.	1889	.50	11,588,000	Jan.	1875	2.00
44	Cumberland, L. & S.	Mont.	5,000,000	500,000	10	*	.....	.....	15,000	Nov.	1889	.03
45	Daly, s. L.	Utah.	3,000,000	150,000	20	.....	.....	.....	1,387,500	Dec.	1891	.25
46	Deer Creek, s. G.	Idaho	1,000,000	200,000	5	*	.....	.....	20,000	June	1889	.05
47	Deadwood-Terra, G.	Dak.	5,000,000	200,000	25	*	.....	.....	‡1,000,000	Nov.	1887	.10
48	Derbec B. Grav., G.	Cal.	10,000,000	100,000	100	90,000	Dec.	1881	.10	240,000	Oct.	1890	.10
49	Dunkin, s. L.	Colo.	5,000,000	200,000	25	*	.....	.....	390,000	Oct.	1889	.05
50	Dunstone, G. & S. L.	Mont.	1,000,000	200,000	5	*	.....	.....	6,000	Nov.	1888	.03
51	Eclipse, L. S.	Colo.	100,000	100,000	1	.....	.....	.....	20,000	Nov.	1887	.10
52	Elkhorn, s. L.	Mont.	1,000,000	200,000	5	*	.....	.....	¶896,000	June	1891	1.00
53	Enterprise, s.	Colo.	100,000	10,000	10	*	.....	.....	40,000	May.	1888	1.00
54	Eureka Con., s. L. G.	Nev.	5,000,000	50,000	100	550,000	June	1889	.50	4,892,500	Oct.	1890	.25
55	Evening Star, s. L.	Colo.	500,000	50,000	10	*	.....	.....	1,450,000	Dec.	1889	.25
56	Father de Smet, G.	Dak.	10,000,000	100,000	100	200,000	Nov.	1878	1.00	1,125,000	Dec.	1885	.20
57	Franklin, C.	Mich.	1,000,000	40,000	25	220,000	June	1871	.....	1,016,000	July	1851	2.00
58	Freeland, s. G.	Colo.	5,000,000	200,000	25	*	.....	.....	.....	190,000	July	1886	.10
59	Garfield Lt., G. & S.	Nev.	500,000	100,000	5	.....	.....	.....	.....	90,000	April	1888	.12½
60	Gould & Curry, s. G.	Nev.	10,800,000	108,000	100	3,988,800	Sept.	1890	.25	3,826,800	Oct.	1870	10.00
61	Grand Prize, s.	Nev.	10,000,000	100,000	100	785,000	Jan.	1890	.30	495,000	Mar.	1884	.25
62	Granite, s. L.	Idaho	500,000	500,000	1	*	.....	.....	.....	28,400	Oct.	1889	.02
63	Granite Mountain, s.	Mont.	10,000,000	400,000	25	.....	.....	.....	.....	11,000,000	June	1891	.25
64	Green Mountain, G.	Cal.	1,250,000	125,000	10	.....	.....	.....	.....	212,000	Nov.	1881	.07½
65	Hale & Norcross, G. & S.	Nev.	11,200,000	112,000	100	5,142,800	April	1890	.50	1,822,000	Aug.	1888	.50
66	Hecla Con., s. G. L. C.	Mont.	1,500,000	30,000	50	.....	.....	.....	.....	1,650,000	June	1891	.50
67	Hel'a Mg. & Red, s. L. G.	Mont.	3,315,000	663,000	5	*	.....	.....	.....	197,970	July	1886	.06
68	Holmes, s.	Nev.	10,000,000	100,000	100	370,000	May	1890	.25	75,000	April	1886	.25
69	Homestake, G.	Dak.	12,500,000	125,000	100	200,000	July	1878	1.00	4,718,750	July	1891	.10
70	Honorine, s. L.	Utah.	500,000	50,000	10	37,500	April	1889	.05	125,000	Sept.	1887	.05
71	Hope, s.	Mont.	1,000,000	100,000	10	*	.....	.....	.....	233,252	April	1888	.25
72	Horn-Silver, s. L.	Utah.	10,000,000	400,000	25	*	.....	.....	.....	4,300,000	June	1891	12½
73	Hubert, G.	Colo.	1,000,000	1,000,000	1	*	.....	.....	.....	247,000	Dec.	1889	.00½
74	Idaho, G.	Cal.	310,000	3,100	100	.....	.....	.....	.....	2,303,750	July	1891	3.00
75	Illinois, s.	N. M.	100,000	100,000	1	*	.....	.....	.....	45,000	April	1889	.20
76	Iron Hill, s.	Dak.	2,500,000	250,000	10	134,000	July	1889	.03	156,250	Nov.	1887	.07½
77	Iron Mountain, S.	Mont.	500,000	500,000	1	*	.....	.....	.....	120,000	Nov.	1891	.05
78	Iron-Silver, s. L.	Colo.	10,000,000	500,000	20	*	.....	.....	.....	2,500,000	April	1889	.20
79	Jackson, G. & S.	Nev.	5,000,000	50,000	100	237,500	Nov.	1888	.30	63,000	Jan.	1891	.10
80	Jay Gould, G. & S.	Mont.	2,000,000	40,000	5	*	.....	.....	.....	459,000	May	1891	.04
81	Kearsarge, C.	Mich.	1,000,000	40,000	25	190,000	Oct.	1887	1.00	83,000	Jan.	1890	2.00
82	Kentuck, s. G.	Nev.	3,000,000	30,000	100	417,430	Dec.	1890	.35	1,350,000	Dec.	1890	.10
83	La Plata, s. L.	Colo.	4,000,000	200,000	10	*	.....	.....	.....	610,000	Sept.	1892	.30
84	Leadville Con., s. L.	Colo.	4,000,000	400,000	10	*	.....	.....	.....	423,000	April	1887	.05
85	Lexington, G. & S.	Mont.	4,000,000	40,000	100	*	.....	.....	.....	565,000	Jan.	1885	2.00
86	Little Chief, s. L.	Colo.	10,000,000	200,000	50	*	.....	.....	.....	820,000	Dec.	1890	.05
87	Little Rule, s.	Colo.	500,000	500,000	1	.....	.....	.....	.....	170,000	July	1891	.02
88	Mammoth, s. L. C.	Utah.	10,000,000	400,000	250	110,000	.....	1882	.25	960,000	June	1891	.10
89	Martin White, s.	Nev.	10,000,000	100,000	100	1,225,000	Oct.	1889	.25	140,000	Dec.	1886	.25
90	Mary Murphy, s. G.	Colo.	350,000	3,500	101	*	.....	.....	.....	175,000	May	1888	5.00
91	Matchless, s. L.	Colo.	500,000	500,000	1	*	.....	.....	.....	15,000	Feb.	1890	.00½
92	May Mazeppa, s. L.	Colo.	1,000,000	100,000	1	.....	.....	.....	.....	168,000	July	1891	.01½
93	Minas Prietas, G. & S.	Mex.	1,000,000	100,000	10	*	.....	.....	.....	350,000	Dec.	1890	.50
94	Minnesota, C.	Mich.	1,000,000	40,000	25	420,000	April	1880	1.00	1,420,000	Mar.	1876	.....
95	Mollie Gibson, s.	Colo.	5,000,000	1,000,000	5	*	.....	.....	.....	400,000	July	1891	.05
96	Monitor, G. & S.	S. Dak	2,500,000	250,000	10	.....	.....	.....	.....	45,000	Oct.	1890	.03
97	Mono, G.	Cal.	5,000,000	50,000	100	760,000	Sept.	1890	.25	12,500	Mar.	1886	.25
98	Montana, Lt., G. & S.	Mont.	3,300,000	660,000	5	*	.....	.....	.....	2,613,075	June	1891	12½
99	Morning Star, s. L.	Colo.	1,000,000	100,000	10	.....	.....	.....	.....	925,000	April	1891	.25
100	Moulton, s. G.	Mont.	2,000,000	400,000	5	*	.....	.....	.....	380,000	Dec.	1887	.07½
101	Mount Pleasant, G.	Cal.	150,000	150,000	1	*	.....	.....	.....	150,000	Feb.	1887	.30
102	Mt. Diablo, s.	Nev.	5,000,000	50,000	100	137,500	June	1888	2.00	180,000	Sept.	1889	.40
103	Napa, Q.	Cal.	700,000	100,000	7	.....	.....	.....	.....	420,000	July	1891	.10
104	Navajo, G. & S.	Nev.	10,000,000	100,000	100	500,000	April	1890	.15	229,995	April	1889	.10
105	New California, G.	Colo.	800,000	160,000	5	*	.....	.....	.....	48,800	May.	1890	12½
106	New Guston, s.	Colo.	550,000	110,000	5	.....	.....	.....	.....	785,000	April	1891	1.00
107	New Hoover Hill, G. & S.	C.	300,000	120,000	2½	.....	.....	.....	.....	30,000	Dec.	1885	.06½
108	Northern Belle, s.	Nev.	5,000,000	50,000	100	425,000	Jan.	1884	8.00	2,400,000	April	1885	.50
109	North Belle Isle, s.	Nev.	10,000,000	100,000	100	395,000	April	1890	.2	230,000	May	1888	.50
110	North Star, G.	Cal.	1,000,000	100,000	10	.....	.....	.....	.....	360,000	April	1889	.50
111	Ontario, s. L.	Utah.	15,000,000	150,000	100	.....	.....	.....	.....	11,975,000	June	1891	.50
112	Ophir, G. & S.	Nev.	10,000,000	100,000	100	4,210,640	April	1890	.50	1,595,800	Jan.	1888	1.00
113	Original, s. G.	Mont.	1,500,000	60,000	25	*	.....	.....	.....	138,000	Jan.	1889	.05
114	Ory, s. L. G.	Colo.	500,000	50,000	5	.....	.....	.....	.....	95,000	July	1891	.02
115	Osceola, C.	Mich.	1,250,000	50,000	25	480,000	April	1876	1.6	1,547,500	July	1891	1.00
116	Parrot, C.	Mont.	1,800,000	180,000	10	.....	.....	.....	.....	850,000	May.	1891	.10
117	Peacock, s. G. C.	N. M.	2,000,000	200,000	10	*	.....	.....	.....	60,000	Nov	1886	.....
118	Plumas Eureka, G.	Cal.	1,406,250	140,625	10	.....	.....	.....	.....	2,548,000	Oct.	1885	.37½
119	Plymouth Con., G.	Cal.	5,000,000	100,000	50	*	.....	.....	.....	2,280,000	Feb.	1888	.40
120	Quicksilver, pref., Q.		4,300,000	43,000	100	.....	.....	.....	.....	1,720,000	Dec.	1890	1.50
121	" com., Q.	Cal.	5,700,000	57,000	100	.....	.....	.....	.....	643,867	July	1882	.40
122	Quincy, C.	Mich.	1,000,000	40,000	2	200,000	Dec.	1862	.....	5,970,000	Aug.	1891	5.00
123	Reed National, s. G.	Colo.	500,000	500,000	1	*	.....	.....	.....	50,000	Dec.	1889	.01
124	Rialto, G.	Colo.	300,000	300,000	1	*	.....	.....	.....	13,500	July	1891	.01½
125	Richmond, s. L.	Nev.	1,350,000	54,000	25	*	.....	.....	.....	4,332,887	Jan.	1891	.62½
126	Ridge, C.	Mich.	500,000	20,000	25	219,93	Mar	188	.5	99,765	Feb.	1886	.50
127	Robinson Con., s. L.	Colo.	10,000,000	200,000	5	*	.....	.....	.....	585,000	Mar.	1886	.05
128	Running Lode, G.	Colo.	1,000,000	1,000,000	1	*	.....	.....	.....	15,000	June	1891	.00½
129	Savage, s.	Nev.	11,200,000	112,000	10	6,604,000	Nov.	188	.5	4,460,000	June	1865	3.00
130	Sheridan, s. G.	Colo.	300,000	3,000	10	*	.....	.....	.....	225,000	Dec.	189	3.33½
131	Shoshone, G.	Idaho	150,000	150,000	1	.....	.....	.....	.....	7,500	April	188	.01
132	Sierra Buttes, G.	Cal.	2,250,000	12,500	1	.....	.....	.....	.....	1,492,357	April	188	.12½
133	Sierra Nevada, s. G.	Nev.	10,000,000	100,000	100	6,246,91	May	189	.5	102,000	Jan.	1871	1.00
134	Sierra Nevada, s. L.	Idaho	1,000,000	1,000,000	1	*	.....	.....	.....	40,000	May.	188	.02
135	Silent Friend.	Colo.	500,000	500,000	1	.....	.....	.....	.....	32,500	April	1891	.02½
136	Silver Cord, s. L. G.	Colo.	4,500,000	45,000	10	.....	.....	.....	.....	225,000	Nov.	1882	.25
137	Silver King, s.	Ariz.	10,000,000	100,000	10	130,00	Nov.	189	.3	1,950,000	July.	1887	.25
138	Silver Mg. of L. V., s. L.	N. M.	500,000	500,000	.....	.....	.....	.....	.....	375,000	May	1891	.05
139	Small Hopes Con., s.	Colo.	5,000,000	250,000	2	*	.....	.....	.....	3,162,500	Oct.	1891	.10
140	Spring Valley, G.	Cal.	200,000	200,000	1	50,00	Oct.	18	.2	50,000	Jan.	1849	.25
141	Standard, G. & S.	Cal.	10,000,000	100,000	10	100,0	Jan	18	.5	3,595,000	June	188	.05
142	Stormont, s.	Utah.	500,000	500,000	1	*	.....	.....	.....	155,000	Nov	188	.05
143	St. Joseph, L.	Mo.	1,500,000	150,000	1	*	.....	.....	.....	1,974,000	Dec.	189	.02
144	Tamarack, C.	Mich.	1,250,000	50,000	25	520,0	April	18	.3	2,097,000	Aug.	189	4.00
145	Tombstone, G. & L.	Ariz.	12,500,000	50,000	25	*	.....	.....	.....	1,250,000	April	188	.10
146	United Verde, C.	Ariz.	3,000,000	300,000	10	*	.....	.....	.....	127,500	May	189	.10
147	Viola Lt., s. L.	Idaho	750,000	150,000	5	.....	.....	.....	.....	337,500	Nov.	188	.37½
148	Ward Con., s.	Colo.	2,000,000	200,000	10	.....	.....	.....	.....	20,000	Dec.	1889	.05
149	Woodside, s. L.	Utah	100,000	100,000	10	.....	.....	.....	.....	25,000	Oct.	188	.25
150	W. Y. O. D.	Cal.	30,000	15,000	2	11,2	Oct	189	.1	4,500	May.	189	.1
151	Yankee Girl, s.	Colo.	2,500,000	250,000	10	.....	.....	.....	.....	1,405,000	April	1891	.5
152	Yellow Jacket, G. & S.	Nev.	12,000,000	120,000	100	5,538,0	Jar	188	.50	2,184,000	Aug.	1871	2.50
153	Young America, G.	Cal.	.....	.....	.....	.....	.....	.....	.....	44,000	Jan.	188	.10

NON-DIVIDEND PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Shares. Par	Assessments. Total levied.	Assessments. Date and am't of last.		
1	Allegheny, s.	Colo.	$5,000,000	500,000	$10	*			
2	Alliance, s. G.	Utah	100,000	100,000	1	$120,000	Feb.	1891	.20
3	Allouez, C.	Mich.	2,000,000	80,000	25	737,000	Jan.	1890	.70
4	Alpha Con., G. & S.	Nev.	3,000,000	30,000	100	112,500	Sept.	1890	.25
5	Alta, s.	Nev.	10,080,000	100,800	100	3,359,800	Sept.	1890	.50
6	American Flag, s.	Colo.	1,250,000	125,000	10	300,000	June	1887	.....
7	Amity, s.	Colo.	250,000	250,000	1	.....	.....	.....	.....
8	Anchor s. L. G.	Utah.	3,000,000	150,000	20	410,000	June	1890	.20
9	Anglo-Montana, Lt.	Mont.	600,000	120,000	5	.....	.....	.....	.....
10	Astoria, G.	Cal.	200,000	100,000	2	.....	.....	.....	.....
11	Barcelona, G.	Nev.	5,000,000	200,000	25	*	.....	.....	.....
12	Bechtel Con., G.	Cal.	10,000,000	100,000	100	173,500	.....	1883	.10
13	Belmont, G.	Cal.	5,000,000	500,000	1	.....	.....	.....	.....
14	Belmont, s.	Nev.	5,000,000	50,000	100	735,000	April	1888	.10
15	Best & Belcher, s. G.	Nev.	10,000,000	100,000	100	2,279,277	Aug.	1890	.25
16	Black Oak, G.	Cal.	3,000,000	300,000	10	*	.....	.....	.....
17	Boston Con., G.	Cal.	10,000,000	100,000	100	170,000	Nov.	1885	.25
18	Bremen, s.	N. M.	5,000,000	500,000	10	*	.....	.....	.....
19	Brownlow, G.	Colo.	250,000	250,000	1	.....	.....	.....	.....
20	Brunswick, G.	Cal.	2,000,000	400,000	5	*	.....	.....	.....
21	Buckeye, s. L.	Mont.	1,000,000	500,000	2	.....	.....	.....	.....
22	Bullion, s. G.	Nev.	10,000,000	100,000	100	1,540,000	Nov.	88	.50
23	Butte & Boston, C. & S.	Mont.	5,000,000	200,000	25	*	.....	.....	.....
24	Calaveras, G.	Cal.	500,000	500,000	1	*	.....	.....	.....
25	Carisa, G.	Wy.	500,000	500,000	1	*	.....	.....	.....
26	Carupano, G. & S. L. C.	Ven.	200,000	100,000	2	*	.....	.....	.....
27	Cashier, G. & S.	Colo.	500,000	250,000	2	*	.....	.....	.....
28	Cherokee, G.	Cal.	1,500,000	150,000	10	*	.....	.....	.....
29	Chollar, s. G.	Nev.	11,200,000	112,000	100	1,540,000	Nov.	88	.50
30	Cleveland, T.	Dak.	1,000,000	500,000	2	*	.....	.....	.....
31	Colchis, s. G.	N. M.	500,000	50,000	10	.....	.....	.....	.....
32	Colorado Silver	Colo.	1,625,000	325,000	5	*	.....	.....	.....
33	Comstock Ten.	Nev.	10,000,000	100,000	100	35,000	Mar	88	.15
34	Con. Imperial, G. & S.	Nev.	5,000,000	50,000	100	1,875,000	July	88	.05
35	Con. New York, s. G.	Nev.	5,000,000	100,000	50	75,000	Nov.	88	.15
36	Con. Pacific, G.	Cal.	6,000,000	60,000	100	198,000	June	88	.10
37	Con. Silver, s.	Mo.	2,500,000	250,000	10	.....	.....	.....	.....
38	Crescent, s. L.	Colo.	3,000,000	300,000	10	*	.....	.....	.....
39	Crocker, s.	Ariz.	10,000,000	100,000	100	150,000	June	88	.15
40	Crowell, N. C.	N. C.	500,000	50,000	1	.....	.....	.....	.....
41	Dahlonega, G.	Ga.	250,000	25,000	1	*	.....	.....	.....
42	Dandy, s.	Colo.	5,000,000	500,000	10	*	.....	.....	.....
43	Decatur, s.	Colo.	1,500,000	300,000	5	*	.....	.....	.....
44	Denver City, s.	Colo.	5,000,000	500,000	10	*	.....	.....	.....
45	Denver Gold, G.	Colo.	300,000	60,000	5	*	.....	.....	.....
46	Dickens-Custer, s.	Idaho	2,130,000	426,000	5	*	.....	.....	.....
47	Durango, G.	Colo.	500,000	500,000	1	*	.....	.....	.....
48	Eastern Dev. Co., Lt.	N. S.	1,500,000	150,000	10	950,00	Jar	88	.00
49	El Cristo, G. & S.	U.S.C.	1,000,000	500,000	2	*	.....	.....	.....
50	El Dorado, G.	Cal.	1,000,000	250,000	4	*	.....	.....	.....
51	El Talento, G.	U.S.C.	1,000,000	500,000	2	.....	.....	.....	.....
52	Emmons, s. L.	Colo.	2,000,000	2,000,000	1	.....	.....	.....	.....
53	Empire, s.	Utah.	1,000,000	100,000	10	.....	.....	.....	.....
54	Eureka Tunnel, s. L.	Nev.	10,000,000	100,000	100	*	.....	.....	.....
55	Exchequer, s. G.	Nev.	10,000,000	100,000	100	865,00	July	89	.25
56	Found Treasure, G. & S.	Nev.	10,000,000	100,000	10	81,50	May	89	.25
57	Gogebic I. Syn., I.	Wis.	5,600,000	280,000	2	.....	.....	.....	.....
58	Gold Cup, s.	Colo.	500,000	500,000	1	*	.....	.....	.....
59	Golden Era, s.	Mont.	2,000,000	200,000	10	*	.....	.....	.....
60	Gold Rock, G.	Cal.	1,000,000	500,000	.....	*	.....	.....	.....
61	Goodshaw, G.	Cal.	10,000,000	100,000	100	*	.....	.....	.....
62	Grand Belt, C.	Tex.	12,000,000	120,000	100	.....	.....	.....	.....
63	Grand Duke.	Colo.	800,000	80,000	10	.....	.....	.....	.....
64	Great Romance, G.	U.S.C.	1,000,000	500,000	2	*	.....	.....	.....
65	Gregory Con., G.	Mont.	3,000,000	300,000	10	.....	.....	.....	.....
66	Harlem M. & M. Co., G.	Cal.	1,000,000	200,000	5	.....	.....	.....	.....
67	Hartery Con., G.	Cal.	1,000,000	100,000	10	22,00	Oct.	89	.05
68	Head Cent. & Tr., s. G.	Ariz.	10,000,000	100,000	100	*	.....	.....	.....
69	Hector, G.	Cal.	1,500,000	300,000	5	45,00	Jan.	88	.15
70	Highland, C.	Mich.	500,000	25,000	20	.....	.....	.....	.....
71	Holywood	Cal.	2,000,000	100,000	5	.....	.....	.....	.....
72	Hortense, s.	Colo.	2,000,000	200,000	1	.....	.....	.....	.....
73	Huron, C.	Mich.	1,000,000	40,000	2	280,00	May	88	.00
74	Iron, Gold & Silver, s.	N. M.	2,000,000	200,000	1	*	.....	.....	.....
75	Ironton, I.	Wis.	1,000,000	40,000	2	.....	.....	.....	.....
76	Iroquois, C.	Mich.	1,250,000	50,000	2	.....	.....	.....	.....
77	Isabella, s.	Ariz.	1,000,000	10,000	10	.....	.....	.....	.....
78	Julia Con., G. & S.	Nev.	11,000,000	110,000	10	1,455,00	Jan.	88	.10
79	Lacrosse, G.	Colo.	1,000,000	100,000	1	*	.....	.....	.....
80	Lee Basin, s.	Colo.	5,000,000	500,000	1	*	.....	.....	.....
81	Madeleine, G. & L.	Colo.	750,000	75,000	.....	*	.....	.....	.....
82	Mammoth

NEW YORK MINING STOCKS QUOTATIONS.

DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	July 18.		July 20.		July 21.		July 22.		July 23.		July 24.		SALES.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Adams, Colo.									1.75	1.70			1,000
Alice, Mont.													
Aspen, Nev.													
Atlantic, Mich.													
Bassick													
Belcher	1.40												100
Bodie Cons., Cal.													
Bos. & Mont., Mont													
Breece, Colo.													
Bulwer, Cal.													
Caledonia, S. Dak.									.65				100
Catalpa													
Chrysolite, Colo.													
Colorado Central, Colo.													
Commonwealth, Nev.													
Comstock T. bonds, Nev.													
" scrip., Nev.													
Cons. Cal. & Va., Nev.					5.25				6.13				200
Crown Point, Nev.			1 05		1.10				1.25				300
Deadwood, Dak.	1.25												100
Eureka Cons., Nev.					3.25								100
Father de Smet, S. Dak.													
Franklin, Mich.													
Freeland, Colo.													
Gould & Curry, Nev.	1.25						1.45		1.60		1.70		400
Granite Mountain, Mont.													
Hale & Norcross, Nev.							1.70		1.85				220
Homestake, Dak.													
Horn Silver, Utah.													
Independence, Nev.													
Iron Hill, Dak.													
Kearsarge, Mich.													
Leadville Cons., Colo.					.11								100
Little Chief, Colo.													
Martin White, Nev.													
Mono, Cal.													
Mt. Diablo, Nev.	2.35												200
Navajo, Nev.													
N. Belle Isle, Nev.													
Ontario, Utah.					39 50		39.75	39.38			39.38		225
Ophir, Nev.			2 75		3 00						3.65		325
Osceola, Mich.													
Plymouth, Cal.													
Quicksilver, Pref., Cal.													
" Com., Cal.													
Quincy, Mich.													
Robinson Cons., Colo.													
Savage, Nev.	1.25		1.45						1 70		1.65		400
Sierra Nevada, Nev.					1.95		2.30						200
Silver Cord, Colo.													
Silver King, Ariz.													
Silver Mg. of L. V., N. M.													
Small Hopes, Colo.													
Standard													
Yellow Jacket, Nev.	1 61				1.75		1 75		1.75		1 80		495

NON-DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	July 18.		July 20.		July 21.		July 22.		July 23.		July 24.		SALES.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Alpha, Nev.													
Alta			.70				.75						200
American Flag, Colo.													
Andes, Cal.													
Astoria, Cal.	.01		.01		.01		.01		.01		.01		9,500
Augusta, Ga.													
" bonds.													
Barcelona, Nev													
Belmont, Cal.	.77		.78	.77	.78		.78		.79		.79		1,700
Best & Belcher, Nev.	2.00		2.10		2 25		2.00		2.35		2.70		550
Bonanza King, Cal.													
Brunswick, Cal.	.09		.09		.09		.09		.10	.09			3,400
Bullion, Nev.													
Butte & Bost., Mont.													
Castle Creek, Idaho.													
Challar	1.40		1.50		1.50				2.10		2 15		500
Comstock T., Nev.	.18		.16		.17	.16							6,300
Con. Imperial, Nev.													
Cons. Pacific, Cal.													
Crescent, Colo.													
Del Monte, Nev.													
El Cristo, Rep. of Col.													
Emmett	.70		.70										800
Exchequer, Nev.													
Hollywood, Cal.													
Huron, Mich.													
Justice, Nev													
King & Pembroke, Ont.													
Lacrosse, Colo.													
Lee Basin, Colo.													
Mexican, Nev.			1.70		2.00		2.15		2 30				610
Middle Bar, Cal.													
Monitor, Colo.													
Mutual S. & M. Co., Wash.	.95												100
Nevada Queen, Nev.	.30				.28		.30						700
N. Standard, Cal.													
N. Commonwealth, Nev.													
Occidental, Nev.			.95										200
Oriental & Mil., Nev.													
Phœnix Lead, Colo.													
Phœnix of Ariz.													
Potosi, Colo.							3.90		4.25		4.50		300
Rappahannock, Va.													
S. Sebastian, S. Sal.													
Santa Fe, N. M.													
Scorpion, Nev.	.30												1,000
Seg Belcher, Nev.													
Shoshone, Idaho.													
Silver Hill, Nev.													
Sullivan Con., Dak.													
Sutro Tunnel, Nev.													
Syndicate.													
Tornado Con., Nev.													
Union Cons., Nev.	1.90						2 10						200
Utah, Nev.					.75				.75		.75		400

*Ex dividend. †Dealt in in the New York Stock Ex. Unlisted securities. ‡Assessment paid. §Assessment unpaid. Dividend shares sold, 1,465. Non-dividend shares sold 26,460.
Total New York, 30,925.

BOSTON MINING STOCK QUOTATIONS.

NAME OF COMPANY.	July 17.		July 18.		July 20.		July 21.		July 22.		July 23.		SALES.
Atlantic, Mich					16.50						16.00		200
Bodie, Cal.													
Bonanza Development													
Bost. & Mont., Mont.	45.75	45.25			45.75	45.25	+43¾	43.25	43.00		42.50	42.00	1,431
Breece, Colo.													
Calumet & Hecla, Mich.	257		255		255		255		255	250	250		124
Catalpa, Colo.													
Central, Mich.	18.00												3
Cœur d'Alene, Id.													
Con. Cal. & Va., Nev.													
Dunkin, Colo.													
Eureka, Nev.													
Franklin, Mich.	17.00	16.50			16.50						16.25	15.75	123
Honorine, Utah.													
Horn Silver, Utah.													
Kearsarge, Mich.					12.00		12 00				12.25		203
Little Chief, Colo.													
Little Pittsburg, Colo.													
Minnesota Iron.													
Napa, Cal.			4.00										100
Ontario, Utah													
Osceola, Mich.	37.13	37.00	37.50	37.00	36.75	36.63	37.00		36.50		37.00	36.50	226
Quincy, Mich.	107								110		110		25
Ridge, Mich.													
Sierra Nevada, Nev.													
Silver King, Ariz.													
Stormont, Utah.													
Tamarack, Mich.	154				151	150	150		150		155	150	100
Tecumseh, Mich.													

NAME OF COMPANY.	July 17.		July 18.		July 20.		July 21.		July 22.		July 23.		SALES
Allouez, Mich.			2.25		2.25		2.25		2.25				1,750
Arnold, Mich.			.85				.85	.80			.85		300
Aztec, Mich.													
Brunswick, Cal.													
Butte & Boston, Mont.			15.75	15.00	15.00	14.50					15.00	14.50	937
Centennial, Mich.	14.75				14.50		14.75						200
Comstock, T., Nev.													
Copper Falls, Mich.													
Crescent, Colo.													
Dana, Mich.													
Don Enrique, N. M.													
El Cristo, S. A.													
Hanover, Mich.													
Humboldt, Mich.													
Hungarian, Mich.													
Huron, Mich.							1.13	1.00	1.00				400
Mesnard, Mich.													
National, Mich.													
Native, Mich.													
Oriental & M., Nev.													
Phœnix, Ariz.													
Pontiac, Mich.													
Rappahannock, Va.													
Santa Fe, N. Mex.							.45				.45		1,300
Shoshone, Idaho.													
South Side, Mich.													
Star, Mich.													
Washington, Mich.													
Winthrop, Mich.													

†Ex-dividend. Boston: Dividend shares sold, 2,605. Non-dividend shares sold, 4,887. Total Boston, 7,492.

COAL STOCKS.

NAME OF COMPANY.	July 18.		July 20.		July 21.		July 22.		July 23.		July 24.		Sales.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
American Coal.													
Cambria Iron.									74				25
Cameron Coal & I. Co.													
Ches. & O. R. R.													
Chic. & Ind. Coal R. R.													
Do. pref.													
Col. C. & I.			32	31	31	30¾	31¾	30⅝	30⅞	30⅝	31	30⅝	2,355
Col. C. & Hocking C. I.													
Consolidation Coal.													
Del. & H. C.	128	127½	127¾	127	127⅜	126¾	128	127½	128¾	127¾			1,242
†D., L. & W. R. R.	133⅞	132⅝	133¾	132¾	133½	133	133⅝	133⅜	133⅜	133¼	133	132	15,857
Hocking Valley.											24		100
Hunt & Broad Top.			22½										309
Do. pref.			45¾		44¾		44½	44	44½	44			321
Illinois C. & Coke Co.													
†Lehigh C. & N.	46¾		46¾		46¾		46⅝	46⅜	46⅜	46¼			626
†Lehigh Valley R. R.	48	47⅞	48	48¾	48	47⅞	48	47⅝	48	47⅝			555
Lehigh & Wilk. Coal.													
Mahoning Coal.													
Do. pref.													
Maryland Coal.									19		18½		110
Morris & Essex.	140						142				140⅜		225
†New Central Coal.													
N. J. C. R. R.	112	111½	111⅜	110½	110¾	110¼	111		111	110¾	110	109½	2,774
N. Y. & S. Coal.													
N. Y., Susq. & West.			7⅛		7		7⅛	6⅞	7				610
Do. pref.													
N. Y. & Perry C. & I.													
†Norfolk & West. R. R.													
†Do. pref.			48	47⅜					49½		49½		160
†Penn. Coal.													
†Penn. R. R.	50⅛	50⅜	50⅜	50¼	50⅝	50¼	50⅝		50⅝	50¼			1,827
Ph. & R. R. R.			28¾		28⅛	28					28⅛	28	5,925
Sunday Creek Coal.													
Do. Pref.													
Tennessee C. & I. Co.					31	30			30¾	30⅛			1,405
Do. pref.													
Westmoreland Coal.													

† Par value, $50. Total sales, 34,421.

Deadwood.

JULY 18.

The following are the closing quotations:

Anna	.03½	
Bullion	.02½	.03
Carthage	.01¾	.01¾
Cora	.04	.05
Double Standard	.12	.13
Emmett	.01½	.02
Equitable	.01	
Florence	.03	.04
Golden Reward	.35	.36
Harmony	.05	.05½
Hermit	.02	.03
Hesta A	.03	.03½
Iron Hill	.14	.15†
Isidora	.40	
New Era	.02	.02½
Maggie	.07	.10
Mikado	.04	.05
Mutual	.01	.01¼
Rainbow	.02½	.03
Retriever	.19½	.23
Ross Hannibal	.07	.09
Ruby Wilkes	.01	
Seab'ry-Calkins	.03	.03¼
Steward	.07	.08
Tornado	.12	.13
Troy	.01	.01½
Uncle Sam	.09	.10½

†Assessment paid.

Aspen.

Highest and lowest prices for the week ending July 18:

Argentum Juniata	$1.25	$1.53
Aspen Deep	.10	
Best Friend	.21	.25
Bushwacker	.21	.24
Della S.	4.00	4.50
Little Annie	.21	.23
Mollie Gibson	4.00	4.20
Nolan Creek		.10
Park, Mamie & Queen.		
Ontiac	.11	.13
St, Joe & Mineral F'rm	.22	.25

San Francisco Mining Stock Quotations.

NAMES OF STOCKS.	CLOSING QUOTATIONS. July 17.	July 18.	July 20.	July 21.	July 22.	July 23.
Alpha						
Alta	.55	.55	.60	.65	.65	.65
Belcher						
Belle Isle	.60	.60	.55	.55	.60	.60
Best & Bel.	1.75	1.80	2.00	2.05	2.20	2.30
Bodie	.55	.60	.50	.65	.65	.67
Bulwer	.20	.30	.25	.30	.30	.35
Challar	1.25	1.30	1.35	1.60	1.00	2.00
Com wealth	.40	.40	.40	.40	.45	.40
Con. C. & V.	4.60	4.30	5.25	5.13	5.63	6.13
Con Pacific						
Crown Point	.90	.90	1.00	1.05	1.15	1.30
Del M'te, Nev.						
Eureka C.				3.00	3.00	3.00
Gould & C.	1.10	1.10	1.25	1.30	1.45	1.55
Hale & N.	1.30	1.35	1.50	1.25	1.75	1.70
M. White						
Mexican	1.60	1.55	1.80	1.95	2.15	2.30
Mono	.30	.25	.30	.40	.35	.45
Mt. Diablo	2.25	2.25	2.25	2.25		
Navajo	.20	.20	.20	.30	.25	.25
Nev. Queen	.30	.30	.20	.30	.30	.30
N. Belle Isle		.40	.40	.35		.60
N. Com'w'lth						.45
Ophir	2.50	2.35	2.90	2.90	3.10	3.45
Potosi	2.75	2.75	3.10	3.70	4.00	4.30
Savage	1.10	1.30	1.40	1.40	1.50	1.50
Sierra Nev.	1.90	1.80	2.20	2.35	2.40	2.65
Union Con.	1.75	1.70	1.90	2.00	2.15	2.25
Utah	.50	.50	.65	.65	.70	.70
Yellow Jack.	1.40	1.45	1.55	1.60	1.60	1.65

STOCK MARKET QUOTATIONS.

Baltimore, Md.

July 23.

COMPANY.	Bid. L.	Asked. H.
Atlantic Coal	$1.00	$1.25
Balt. & N. C.	....	.10
Big Vein Coal	....	1.00
Conrad Hill	....	.10
Cons. Coal	.24@.25	.26@.26½
Diamond Tunnel	.20	.35
George's Crk. C.	1.08	1.11@1.15
Lake Chrome	.10	.15
Maryland & Charlotte	....	...
North State	....	....
Silver Valley	.55	.70@.75

Prices bid and asked, lowest and highest, during the week ending July 23.

Birmingham, Ala.

July 23.

COMPANY.	Bid. L. H.	Asked. L. H.
Ala. Coal & I. Co.	....	$100
Ala. Conn. C. & C. Co.	....	$23
Ala. R. Mill Co	$100	....
*Alice Furnace	$100	....
Anna Howe G. Mg. Co.	$¼	$½
Bessemer Land	$29	$30
Bir. Mg. & Mfg.	....	$35
Cahaba Coal Mg. Co.	....	$61
Camille Gold Mg. Co.	$½	$¾
De Bardeleben C. & I. Co.	$8½	$9½
Decat. L. Imp.	$8¾	$9⅛
Decatur Min. L.	....	$19
Ensley Land	$7½	$9
*Eureka	....	....
Florence L. & Mg. Co.	....	$18¼
Gadsen Land	$3⅜	$3⅞
Hecla Coal Co.	....	....
Hen. S. & M. Co.	$2¾	$4¼
Jagger-Townl'y C. & C. Co.	$8½	$10
Mag-Ellen	$100	....
Mary Lee C. & R.Co.	....	$25
Sheffield C. & I. Co.	$52½	$55
Sloss I. & S	$18½	$21
†Sloss I. & S	$85	$87
‡‡ Sloss I. & S.	$49	$52½
Ten. C. & I. Co.	$32½	$35
" pref.	$86	$88
Tuscaloosa C. I. & L. Co.	....	$24
Vulcan C. & C. Co	$5	$7½
Woodstock I. Co.	$28	$29

* Bonds. † First mortgage. ‡‡ Second mortgage. ** Without interest.

Pittsburg, Pa.

July 23.

COMPANY.	B.	A.
Allegheny Gas Co.	$43.00	$....
Bridgewater Gas Co.	....	....
Chartiers Val. Gas	8.75	9.38
Columbia Oil Co.	....	2.00
Consignee Mg. Co	.20	.50
Consolidated Gas Co.	43.00	....
East End E. Light Co.	....	....
East End Gas Co	....	....
Forest Oil	....	....
Hazlewood Oil Co.	....	....
Hidalgo Mining	....	4.00
La Noria Mining	.40	.25
Luster Mg. Co.	12.75	13.13
Mansfield C. & C. Co.	....	...
Manuf'turers Gas Co.	24.00	25.00
Nat. Gas Co. of W. Va	57 50	60.00
N. Y. & Clev. Gas Coal	....	40.00
Ohio Valley Gas	20.00	....
Pennsylvania Gas	....	11.00
People's Natural Gas.	....	30.00
People's N. G. & P. Co.	7.25	....
Philadelphia Co	10.88	11.13
Pine Run Gas Co	....	....
Pittsburg Gas	72.00	....
Silverton Mg. Co.	1.75	2.00
South Side Gas	....	....
Sterling Silver Mg. Co.	4.00	5.00
Tuna Oil Co.	....	55.00
Union Gas	....	....
Washington Oil Co.	....	91.50
W house A. B. Co.	94.75	95.50
W'house Brake Co	....	75.00
W'house E. Light	10.88	11.75
W'moreland & Camb.	....	....
Wheeling Gas	....	20.00

St. Louis.

July 22.

CLOSING PRICES.

COMPANY.	Bid.	Asked.
Adams, Colo.	$	$ ....
American & Nettie	.26½	.20
Aztec, N. Mex.	....	.10
Bi-Metallic	34.00	....
Central Silver	....	.02
Cleveland, Colo.	....	....
Elizabeth	1.75	1.92½
Four Mile	....	.25
Gold King	....	....
Granite Mountain, Mont.	22.50	....
Hope	....	1.55
Ingram	....	....
I. X. L. Colo.	....	....
La Union	....	....
Little Albert	.01½	.02½
Major Budd, Mont.	....	....
Mexican Imp	....	.09
Mickey Breen	.41¼	.55
Montrose Placer, Colo.	.61¼	.72½
Mountain Key	.45	.47½
Nellie	04	....
Old Colony	....	....
Pat Murphy, Colo.	.05	.05½
Puzzle	....	....
Richmond Hill	....	....
St. Louis & Aspen	....	4.00
Samoa	....	....
Silver Age, Colo.	1.15	1.20
Small Hopes, Colo.	.77½	.85
Tourtelotte	....	....
West Granite, Mont.	....	....
Wire Patch	....	....
Yuma, Ariz.	.47½	.65

Trust Receipts.

Sales at the New York Stock Exchange week ending July 24:

	Sales.	Price H.	Price L.
American Cotton Oil	....	....	....
National Lead	6,036	17⅞	17

* Trust receipts.

Trust Stocks.

July 24.

The following closing quotations are reported to-day by C. I. Hudson & Co., members of New York Stock Exchange:

CERTIFICATES.	
Am. Cotton Oil, Com.	$20½@$21½
" " " Pfd	38 @ 40
Am. Sugar Refineries, Com.	79 @ 79⅛
" " Pfd	87 @ 88
Distillers' & Cattle Feeders'.	46 @ 46⅜
Linseed Oil	20 @ 28
National Cordage, Com.	88 @ 88¼
" Pfd	99 @ 100½
National Lead	17 @ 17⅛
Standard Oil	161 @ 162
W. U. Beef Co.	10 @ 14

Foreign Quotations.

London.

July 18.

COMPANY.	Highest.	Lowest.
Almada, Mex.	2s. 3d.	1s. 9d.
Amador, Cal	3s.	2s. 6d.
American Belle, Colo.	16s.	15s.
Appalachian, N. C.	2d.	1d.
Canadian Phos., Can.	10s.	5s.
Colorado, Colo.	2s.	1s. 6d.
Comstock, Utah.	....	....
Cons. Esmeralda, Nev.	1s. 9d.	1s. 3d.
Cordova	....	....
De Lamar, Idaho	£1¼	£1 3-16
Denver Gold, Colo.	6d.	6d
Dickens Custer, Idaho.	2s.	1s. 10d.
East Arevalo, Idaho.	1s. 3d.	9d.
El Callao, Venezuela	£¾	£⅝
Elkhorn, Mont.	£1⅛	£1⅛
Elmore, Idaho	1s. 9d.	1s. 6d.
Emma, Utah	2s. 2d.	1s. 10d.
Empire, Mont.	1s. 3d.	1s.
Flagstaff, Utah	5s. 9d.	5s. 3d.
Garfield, Nev	1s.	6d.
Golden Leaf, Mont	2s.	1s. 11d.
Jay Hawk, Mont	9d.	3d.
Josephine, Cal.	1s. 3d.	3d.
Kohinoor, Colo.	1s. 3d.	9d.
La Luz, Mex.	1s. 9d.	1s. 6d.
La Valera, Mex.	17s. 6d.	15s.
Mammoth Gold, Ariz.	3s. 3d.	2s. 9d.
Montana, Mont.	10s. 6d.	9s. 9d.
New California, Colo.	4s. 6d.	4s.
New Consolidated	9d.	3d.
New Eberhardt, Nev.	1s. 3d.	9d.
Newfoundland, N. F.	3s.	2s. 6d.
N. Gold Hill. N. C.	1s. 3d.	1s.
New Guston, Colo.	£4¼	£3¾
New Hoover Hill, N. C.	9d.	3d.
New La Platte, Colo.	1s.	6d.
New Russell, N. C.	1s. 3d.	9d.
New Viola, Idaho	9d.	3d.
Old Lout, Colo	....	6d.
Palmarejo, Mex.	13s.	13s.
Parker, Gold N. C.	9d.	3d.
Pinos Altos, Mex.	6s. 6d.	5s. 6d.
Pittsburg Cons., Nev.	4s. 6d.	3s. 6d.
Richmond Con., Nev.	£⅞	£⅝
Ruby, Nev.	9d.	3d.
Sam Christian, N. C.	9d.	3d.
Sierra Buttes, Cal.	5s. 6d.	4s. 6d.
" Plumas E. r, Cal.	£⅝	£½
United Mexican, Mex.	5s. 6d.	4s. 6d.
U. S. Placer, Colo.	6d.	6d.
West Argentine, Colo.	2s. 6d.	1s. 6d.
Yankee Girl, Colo.	£1 9s. 6d.	£1 8s.

Paris.

July 18.

	Francs.
Belmez, Spain	800.00
Callao, Venez	10.50
Callao Bis., Venez.	15.00
East Oregon, Ore	4.00
Forest Hill Divide, Cal.	80.00
Golden River, Cal.	130.60
" " parts	30.00
Lexington, Mont	95.00
" parts	2.50
Rio Tinto, Spain	583.12
Tharsis, Spain	163.75

CURRENT PRICES.

Those quotations are for wholesale lots in New York.

CHEMICALS AND MINERALS.

Acid—Acetic, No. 8, pure, 1,040, ℔ lb..04½
Commercial, in bbls. and cbys. 8@8½.02¼
Carbonic, liquefied .40
Chromic, ch. pure .$1.00
for batteries .50
Hydrobromic, dilute, U. S. P. .35
Hydrocyanic, U. S. P. .55
Hydrofluoric .30
Alcohol—95%, ℔ gall. 2.10
Absolute 4.00
Ammoniated 3.00
Alum—Lump, ℔ lb 1¾
Ground, ℔ lb 1⅞
Powdered 4@5
Lump ℔ ton, Liverpool £4 17 6
Sulphate of Alumina, ℔ lb. 1½@2½
Alumina Chloride—Pure, ℔ lb. 1.25
Amalgamating solution, ℔ lb. .60
Ammonia—Sul., in bbls., ℔ lb. 3-16
Carb, ℔ lb. .14
Muriate, white, in bbls., ℔ lb. .08½
Ammoniates—Fish guano, dried. $21
wet 8 50@ 9 50
Acid phosphate, 14% per cent. 72½@ 80
Aqua Ammonia—(in cbys) 18° ℔ lb .03¾
20° ℔ lb. .04¾
26° ℔ lb. .08¾
Antimony—Oxymur, ℔ lb. 4¾
Argols—Red, powdered, ℔ lb. .15
Arsenic—White, powdered ℔ lb. 3@3¼
Red ℔ lb. 5@5½
White at Plymouth, ℔ ton £12 2 6
Asbestos—Am., ℔ ton $50@$300
Italian, ℔ ton. c. i. f. L'pool £18@£60
Ashes—Pot, 1st sorts, ℔ lb. 4¾@4⅞
Pearl 6¼@6½
Asphaltum—P. ton 13.00
Prime Cuban, ℔ lb. 4½@5½c.
Hard Cuban, P ton $28.00
Trinidad, refined, ℔ ton $30.00
Egyptian 8@9
Baryta—Carbonate, pure, ℔ lb. .45
Carbonate, commercial, ℔ lb .10
Chlorate, crystal, ℔ lb. .75
Chloride, commercial, ℔ lb. .10
pure, ℔ lb. .16
Iodide, ℔ oz. .40
Nitrate, powdered, ℔ lb. .15
Sulph., Am. prime white .17@20
Sulph., foreign, floated, ℔ ton. 19½@21.50
Sulph., off color, ℔ ton 11.50@14.00
Carb., lump, f. o. b. L'pool, ton £6
No. 1, Casks, Runcorn, " " £4 10 0
No. 2, bags, Runcorn, " " 3 15 0
Beeswax—Refined, ℔ lb. .32
Benzole—℔ gall. 1.50
Bichromate of Potash—Scotch. 10@12
American 10@12
Bichromate of Soda 8½@11½
Borax—Refined, ℔ lb. 11
Concentrated 8¼@8½
Refined " Liverpool ℔ ton £29
Bromine—℔ lb. .55
Cadmium Bromide—℔ lb. 2.00
Iodide, ℔ lb. 5.50
Chalk—℔ ton 1.75
Precipitated, ℔ lb. 4¾@5
China Clay—English, ℔ ton. 13¼@21.00
Southern, ℔ ton 13.50
Chlorine Water—℔ lb. .10
Chrome Yellow—℔ lb. 10@25
Chromalum—Pure, ℔ lb. .40
Commercial, ℔ lb. 1.12
Cobalt—Oxide, ℔ lb. 2.50@2.90
Copper—Sulph. English Wks. ton £20@£21
Vitriol (blue), ordinary .03
" " extra .03½
Nitrate, ℔ lb. .10
Copperas—Common, ℔ 100 lbs. .70
Best, ℔ 100 lbs. 75@1.00
Liverpool, ℔ ton, in casks £1 15s.
Corundum—Powdered, ℔ lb. 4½@.9
Flour, ℔ lb. .3
Cream of Tartar—Am. 99% 24½
Powdered, 99 p. c. 25
Cryolite—Powdered, ℔ lb. .12
Emery—Grain, ℔ lb. (℔ kg.) 4½@5
Flour, ℔ lb. 2½@10
Epsom Salt—℔ lb. .1¼
Feldspar—Ground, ℔ ton 20.00
Fluorspar—Powdered, No. 1, ℔ ton. 30.00
Fuller's Earth—Lump, ℔ bbl. 90@95
Powdered, ℔ lb. 1¾@2
Fusel Oil—℔ gall. .60
Purified, ℔ gall. .75
Gelatine—Cox's, doz 2.00
Coignet's Gold Label, ℔ lb. 1.00
Silver Label, ℔ lb .88
Heinrich's Gold Label, ℔ lb .75
for emulsion, ℔ lb. 1.00
Nelson's No. 1, ℔ lb. 1.10
No. 1, Shreds, ℔ lb. 1.25
No. 3, ℔ lb. .75
Glauber's Salt—In bbls., ℔ lb. ¾
Glass—Ground, ℔ lb. .10
Glue—Brown, ℔ lb. .20
White, ℔ lb. .30
Glycerine—Concent., ch. pure, ℔ lb. .25
Gold—Chloride, pure, crystals, ℔ oz. 12.00
pure, 15 gr., c. v., ℔ doz. 5 40
liquid, 15 gr. g. s. v., ℔ doz. 5.50
Chloride and sodium, ℔ oz 6.00
15 gr., c. v., ℔ doz. 2.88
Oxide, ℔ oz. 27 25
Gypsum—Calcined, ℔ bbl. 1.25@1.50
Iodine—Resublimed 2.75
Iron—Nitrate, 40°, ℔ lb 1½
47°, ℔ lb. 2½
Kaolin—*See China Clay.*
Lead—Red, ℔ lb. 6¾@7¼
White, American, in oil, ℔ lb. 6½@7¼
White, English, ℔ lb. 8¾@9
Acetate, or sugar of, white 12@13
Nitrate 9@10
Lime Acetate—Amer. Brown 1 10@1.20
" Gray 2.00@2.15
Litharge—Powdered, ℔ lb. 6½@7¼
English flake, ℔ lb. 9@9½
Magnesite—Greek, ℔ ton 20.00
Manganese—Crude, per unit. 23@28
Oxide, ground, per lb. 2½@6½
Marble Dust—℔ bbl. 1.25
Mercuric Chloride—(*Corrosive Sublimate*) ℔ lb. .89
Powdered, ℔ lb. .99
Metallic Paint—Brown per ton. $20@25
Red. $20@25
Mineral Wool—Ordinary slag 1¼
Ordinary rock 2½
Mica—In sheets according to size, 1st quality, ℔ lb. 25@$6.00
Naphtha—Black. 60
Nitre Cake—℔ ton. 8.00
Ochre—Rochelle. 1.35@1.50
Washed Nat Oxford, Lump. 6½@6¾
Washed Nat Oxford, Powder. 7@7½
Golden. 3¾@4
Domestic. ¾@1½
Oils, Mineral
Cylinder, light filtered 15@20
Dark filtered 11@15
Extra cold test 18@20
Dark steam refined 10@18
Phosphorus—℔ lb. 55@60
Precip., red .88
white .93
Plumbago—Ceylon, ℔ lb. 4@5
American, ℔ lb. 5@7
Potash—Kieserite $9@$10
Potassium—Cyanide, ℔ lb., C. P. .72
Special .50
Fused .45
Bromide, ℔ lb. .33
Chlorate, English, ℔ lb 11@14
Chlorate, powdered 13@14
Carb, ℔ lb 544.70@5
Caustic, ℔ lb. 7½@8
Iodide 2.65@2.70
Nitrate, refined, ℔ lb. 6@8
Bichromate, ℔ lb. 10½@11
Yellow Prussiate 32½@35
Red Prussiate 42@45
Pumice Stone—Select lumps, lb. 3¼
Original cks., ℔ lb. 1¾@2
Powdered, pure, ℔ lb. 2 @2½
Pyrites—Non-cupreous, p. units. 11@.12
Quartz—Ground, ℔ ton 14.00@16.00
Rotten Stone—Powdered, ℔ lb. 3½
Lump, ℔ lb. 5½@15
Original cks. 4½@5½
Rubbing stone 7
Sal Ammoniac—in bbls., ℔ lb. 10½
Salt—Liverpool, ground, ℔ sack 75@80
Turk's Island, ℔ bush. 25@28
Salt Cake—℔ ton 8.00
Saltpeter—Crude, ℔ lb. 3¾@4¾
Refined, ℔ lb. 6@8
Soda—Prussiate 17½@18
Phosphate .7@18
Stannate 8@15
Strontium—Nitrate, ℔ lb. 9½@10
Sulphur—Roll, ℔ lb. .021
Flour, ℔ lb. .02
Sylvinit, 23@27% S.O.F., per unit. 40@42½
Talc—Ground French, ℔ lb 1¼@1½
Domestic, ℔ ton $18@$20
c. i. f. Liverpool, ℔ ton £4 5
Terra Alba—French 90@1.00
English 75@80
American, No. 1 —@—
American, No. 2 40@50
Tin—Crystals, in kegs or bbls. 16½
feathered or flossed. 25
Muriate, single 7
Double or strong, 51° B. 9
Oxy. or nitro 10
Bar 25
Vermillion—Imp. English .90 @ .95
Am. quicksilver, bulk .67 @—
Am. quicksilver, bags .68 @ .71
Chinese .95 @1 00
Trieste 90 @ .95
American 11½@ .12
Artificial 8 @ .35
Zinc—Am., Dry, ℔ lb. 4½
Antwerp, Red Seal, ℔ lb. 7½
Paris, Red Seal, ℔ lb 8¾
Muriate solution 4
Sulphate crystals, in bbls., ℔ lb. 3

* Spot.

THE RARER METALS.

Aluminum—Pure, per lb. $ .90
Arsenic—(Metallic), per lb .40
Barium—(Metallic), per gram 4.00
Bismuth—(Metallic), per lb. 2.75
Cadmium—(Metallic), per lb. 1.00
Calcium—(Metallic), per gram. 10.00
Cerium—(Metallic), per gram. 7.50
Chromium—(Metallic), per gram. 1.00
Cobalt—(Metallic), per lb. 6.00
Didymium—(Metallic), per gram. 9.00
Erbium—(Metallic), per gram. 7.50
Gallium—(Metallic), per gram. 140.00
Glucinum—(Metallic), per gram. 12.00
Indium—(Metallic), per gram. 9.00
Iridium—(Metallic), per oz. 7.00
Lanthanum—(Metallic), per gr. 10.00
Lithium—(Metallic), per gram. 10.00
Magnesium—Per lb. 4.50
Manganese—(Metallic), per lb. 1.10
Chem. pure, per oz. 10.00
Molybdenum—(Metallic), per gm .50
Niobium—(Metallic), per gram. 5.00
Osmium—(Metallic), per oz. 65.00
Palladium—(Metallic), per oz. 35.00
Platinum—(Metallic), per oz. 16.50@20.00
Potassium—(Metallic), per lb. 28.00
Rhodium—(Metallic), per gram. 5.00
Ruthenium—(Metallic), per gm. 5.50
Rubidium—(Metallic), per gram. 2.00
Selenium—(Metallic), per oz. 1.80
Sodium—(Metallic), per lb. 2.50
Strontium—(Metallic), per gm. .60
Tantalum (Metallic), per gram. 9.00
Telurium—(Metallic), per lb. 5.00
Thallium—(Metallic), per gram. .25
Titanium—(Metallic), per gram. 2.25
Thorium—(Metallic), per gram. 17.00
Tungsten—(Metallic), per lb. 1.00
Uranium—(Oxide), per lb. 5.00
Metallic, per gm. .20
Vanadium—(Metallic), per gm. 22.00
Yttrium—(Metallic), per gram. 9.00
Zirconium—(Metallic), per oz. 65.00

BUILDING MATERIAL.

Bricks—Fronts, nominal, ℔ 1,000.
Croton 14.00@.....
Wilmington 20.00@21.00
Philadelphia @22.00
Trenton @22.00
Baltimore @35.00
Building Stone—Amherst freestone, ℔ cu. ft. 35@1.00
Brownstone, ℔ cu. ft. 1.00@1.35
Granite, rough, ℔ cu. ft. 45@1.25
Granite, Scotch, ℔ cu. ft. 1.00@1.15
Cement—Rosendale, ℔ bbl. 85@1.10
Portland, American, ℔ bbl. 2.25@2.45
Portland, foreign, ℔ bbl. 2.40@2.50
Portland, " special brands 2.60@2.85
Romar, ℔ bbl. 2.75@2.90
Keene's coarse, ℔ bbl. 4.50@5.50
Keene's fine, ℔ bbl. 7.25@8.50
Slate—Purple and green roofing, ℔ 100 ft. 7.00@7.50
Red roofing, ℔ 100 sq. ft. 12.00
Black roofing, ℔ 100 sq. ft. 4.25@5.50
Lime—St. John, com and finish., ℔ bbl. .90@.95
Glens Falls, com. and fin., ℔ bbl. 85@1.10